WADE-8015

Mini-ITX Board

User's Manual

Version 1.0

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How to Use This Manual

The manual describes how to configure your WADE-8015 system board to meet various operating requirements. It is divided into five chapters, with each chapter addressing a basic concept and operation of Single Host Board.

Chapter 1: System Overview. Presents what you have in the box and give you an overview of the product specifications and basic system architecture for this series model of single host board.

Chapter 2: Hardware Configuration. Show the definitions and locations of Jumpers and Connectors that you can easily configure your system.

Chapter 3: System Installation. Describes how to properly mount the CPU, main memory and Compact Flash to get a safe installation and provides a programming guide of Watch Dog Timer function.

Chapter 4: BIOS Setup Information. Specifies the meaning of each setup parameters, how to get advanced BIOS performance and update new BIOS. In addition, POST checkpoint list will give users some guidelines of trouble-shooting.

Chapter 5: Troubleshooting. Provide various of useful tips to quickly get WADE-8015 running with success. As basic hardware installation has been addressed in Chapter 3, this chapter will basically focus on system integration issues, in terms of backplane setup, BIOS setting, and OS diagnostics.

The content of this manual is subject to change without prior notice. These changes will be incorporated in new editions of the document. The vendor may make supplement or change in the products described in this document at any time.

Chapter 1
System Overview

1.1 Introduction

Portwell Inc., a world-leading innovator in the Industrial PC (IPC) market and a member of the Intel® Embedded and Communications Alliance (Intel ECA), announced today the Portwell WADE-8015 adopting the Mini-ITX form factor. The WADE-8015 of the Intel platform will provide high performance and flexibility for functional expansion, such as Gaming, Kiosk, DS, Medical, Defense, Industrial automation and control applications.

Haswell is the next major architecture from Intel. The WADE-8015 supports the latest Intel® Haswell processors in LGA1150 package which has memory and PCI Express controller integrated to support 2-channel DDR3 memory and PCI Express 3.0 lanes providing great graphics performance. Intel® Haswell processor is one of the most powerful and energy efficient CPU in the world. Portwell have taken advantage of such technology to furnish a series of products that can meet multiple industrial requirements such as cost-effective of CPU performance or industrial systems.

WADE-8015 is based on the Intel® Haswell processor and Intel® Q87 chipset. The Intel Q87 Express Chipset, when combined with a processor from the Intel® Dual Core/Quad Core processor family, delivers smart security, cost saving manageability, and intelligent performance for business platforms. WADE-8015 is the first Portwell off-the-shelf product for by Intel® Q87 Express Chipset, it can be an embedded solution and a good platform for customer to integrate it to the embedded system.

WADE-8015 showcased one of Portwell upcoming motherboard for the Intel® Haswell processors . The WADE-8015 is based on the forthcoming Intel Q87 chipset and supports the new LGA 1150 socket (socket that will be used by Haswell processors). This board has lots of features, including supports total 4x SATA 3 (SAT 6.0 Gbps) storage specification , allows RAID 0/1/5 and 10. supports the latest PCIe 3.0 (one PCI-Express x16 slot) devices for double speed and bandwidth which enhances system performance, two long-DIMM memory slot for DDR3 SDRAM up to 16GB, support total 8 USB2.0 ports (4x rear IO by USB3.0 / 4x on board by USB2.0), VGA / HDMI / DP , two Gigabit Ethernet and one mini-PCIe slot support mSATA.

1.2 Check List

The WADE-8015 package should cover the following basic items

- ✓ One WADE-8015 Mini-ITX Main Board
- ✓ One SATA Cable
- ✓ One I/O Shield bracket
- ✓ One Installation Resources CD-Title

If any of these items is damaged or missing, please contact your vendor and keep all packing materials for future replacement and maintenance.

1.3 Product Specification

- **Main Processor**
  -Intel® Dual Core/Quad Core LGA1150 processor
  -CPU clock bus: 1333/1600 MHz
- **Chipset**
  -Intel® Q87 chipset
- **System BIOS**
  -Phoenix BIOS
- **Main Memory**
  -Two 240 -pin DDR3 Long-DIMM socket support up to 16GB dual channel 1333/1600 MHz memory
- **Expansion Interface**
  -One PCIex16
  -One Mini-PCIe slot(support mSATA)
  -One PCIe x1 gold finger(include 2x PCIex1 signal)
- **SATA Interface**
  -Four SATA 6Gb ports
- **Serial Port**
  -Support total six com ports(one RS232 and one RS232/422/485 on rear S/O, three RS232 and one RS232/422/485 on board header)
- **USB Interface**
  -Support Eight USB (Universal Serial Bus) ports, four on rear I/O(USB3.0) and Six on board header(USB2.0) for internal devices
- **Audio Interface**
  -Connector for Mic-In, Line-In and Line-Out
- **Real Time Clock/Calendar (RTC)**
  -Support Y2K Real Time Clock/Calendar

- **Watch Dog Timer**
  -Support WDT function through software programming for enable/disable and interval setting
  -General system reset
- **On-board Ethernet LAN**
  -Two Gigabit Ethernet (10/100/1000 Mbits/sec) LAN ports using Intel WGI217LM & WGI210AT GbE Ethernet Controller
- **High Drive GPIO**
  -One pin-header for 16 bit GPIO (8bit in & 8bit out)
- **System Monitoring Feature**
  -Monitor system temperature and major power sources.
- **Outline Dimension (L x W)**
  -170mm(6.69'') x 170mm(6.69'')
- **Power Requirements**

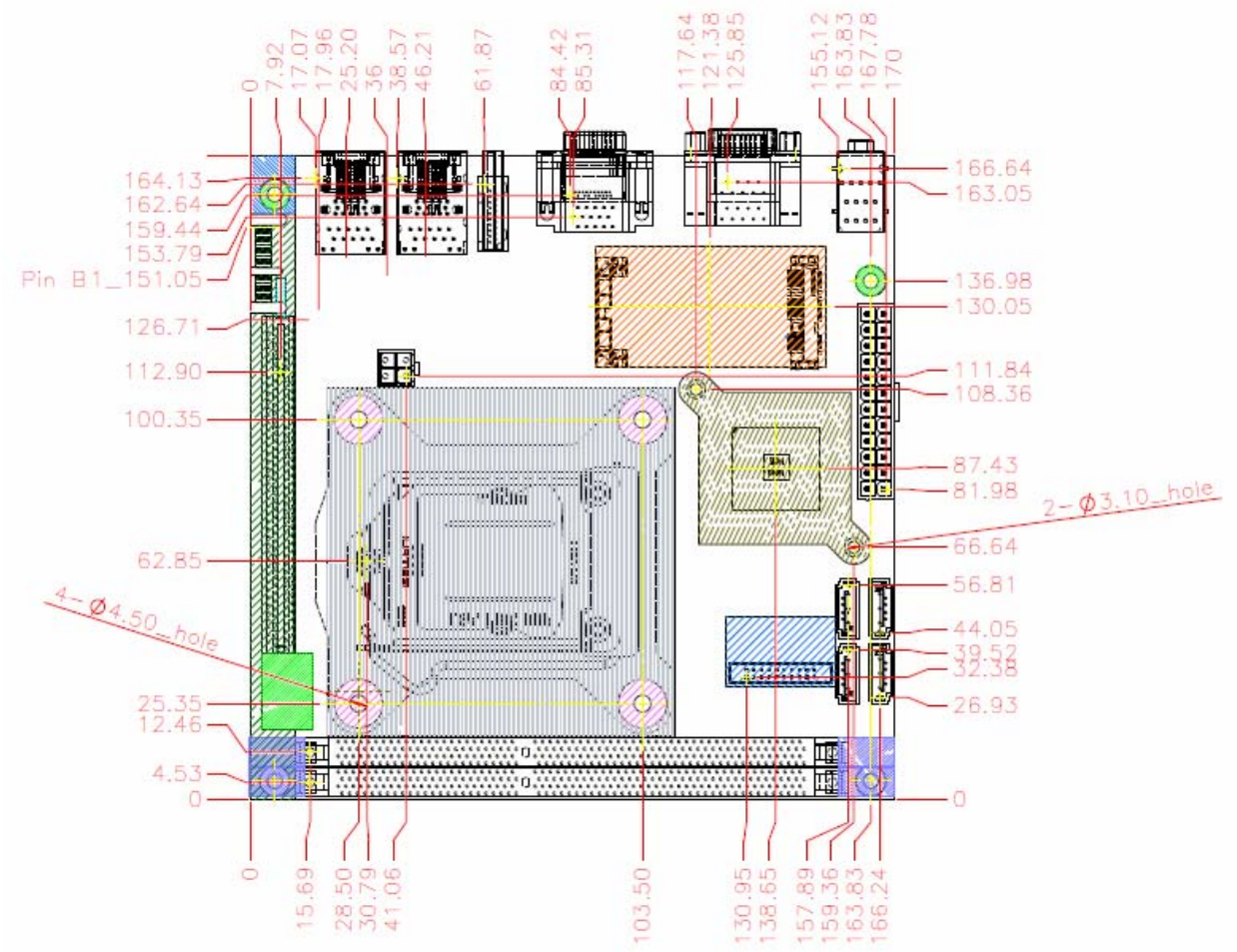
Item	Power ON	Full Loading 10Min	Full Loading 30Min
CPU +12V	1.14	1.18	1.07
System +12V	0.77	1.37	1.34
System +3.3V	0.45	0.62	0.60
System +5V	0.84	1.35	1.27
System+ Device +12V	1.16	1.70	1.72
System+ Device +5V	1.98	1.73	1.72
USB Loading Test	4.89~4.96 V/ 510 mA		

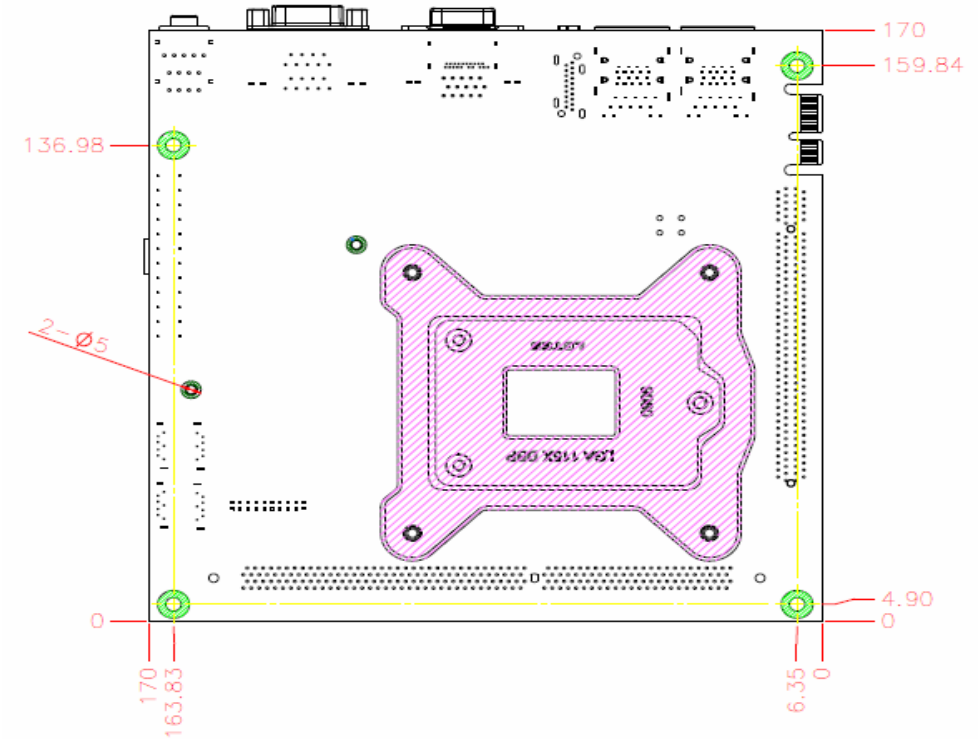
- **Configurations**

CPU Type	Intel(R) Core(TM) i7-4770S CPU @ 3.10GHz L3: 8 MByte
SBC BIOS	Portwell,Inc. WADE-8015 TEST BIOS(30312T00)
Memory	Transcend DDR3 1333 UB-DIMM 1GB*1(K4B1G0846F)
VGA Card	Onboard Intel Haswell HD Graphics-GT2
VGA Driver	Intel Haswell HD Graphics-GT2 Version:9.17.10.2895
LAN Card	Onboard Intel® Ethernet Connection I217-LM
LAN Driver	Intel® Ethernet Connection I217-LM Version:12.3.30.0
LAN Card	Onboard Intel® I210 Gigabit Network Connection
LAN Driver	Intel® I210 Gigabit Network Connection Version:12.3.35.0
Audio Card	Onboard Realtek ALC886 High Definition Audio
Audio Driver	Realtek ALC886 High Definition Audio Version:6.0.1.6662
Chip Driver	Intel(R) Q87 LPC Controller - 8C4E Version 9.4.0.1011
USB3.0 Driver	Intel® USB 3.0 extensible Host Controller Version:2.0.0.100
SATA HDD	Seagate ST3160316AS 160GB

- **Operting Temperature**
  0 °C ~ 60 °C
- **Storage Temperature**
  -20 ~ 80 °C
- **Relative Humidity**
  0% ~ 90%, non-condensing

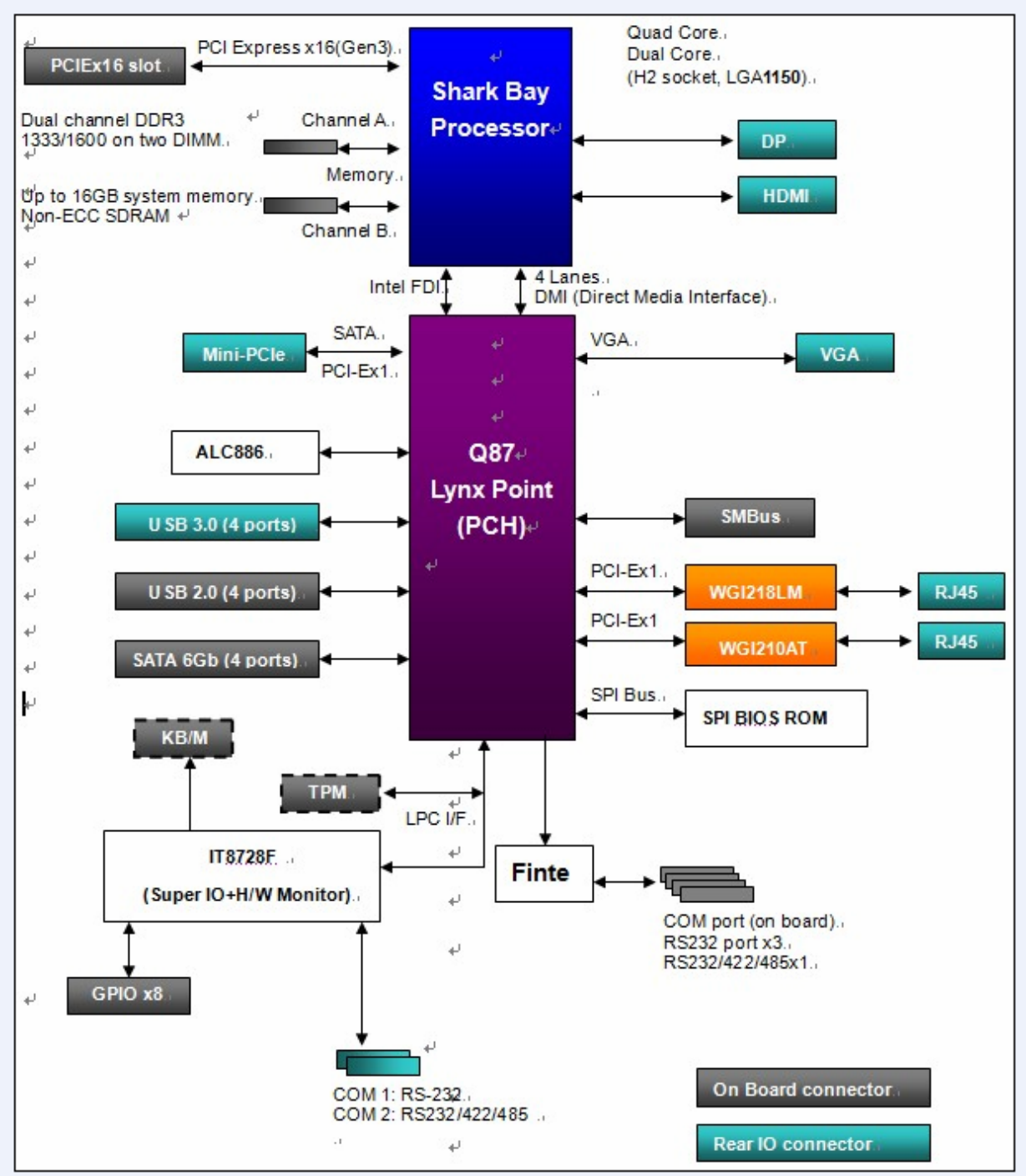
1.3.1 Mechanical Drawing





1.4 System Architecture

All of details operating relations are shown in WADE-8015 System Block Diagram.

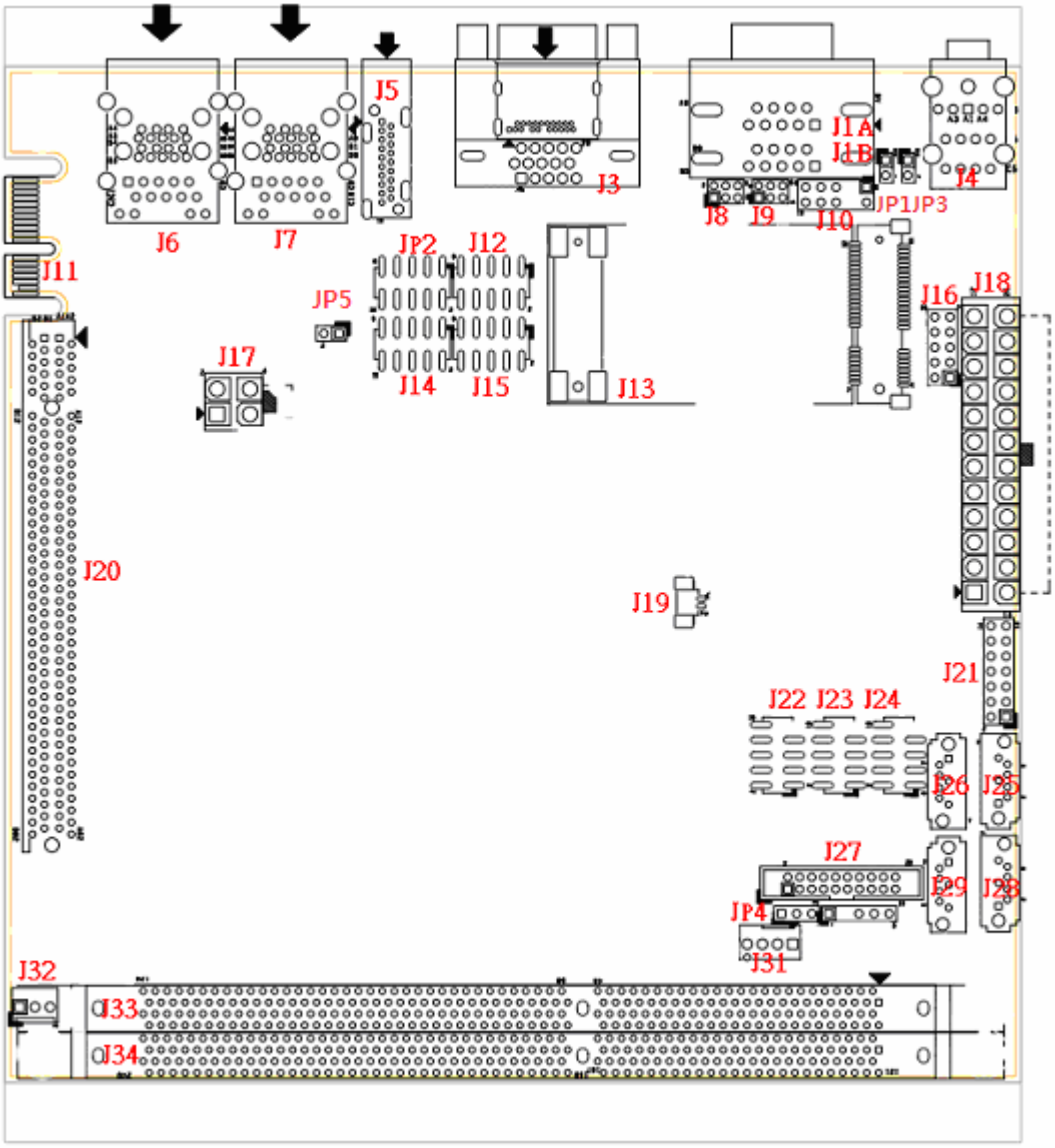


WADE-8015System Block Diagram

Chapter 2
Hardware Configuration

This chapter indicates jumpers', headers' and CONNECTORs' locations. Users may find useful information related to hardware settings in this chapter.

2.1 Jumper Setting



The jumper settings are schematically depicted in this manual as follows:
"★" mean default

JP1 : Mni PCIE & mSATA

JP1	Function
Short	Mini PCIE ★
Open	mSATA

JP3: AUTO POWER BUTTON Select

JP3	Function
short	Auto power button enable
open	Auto power button disable ★

JP4: Clear CMOS Header

JP4	Function
1-2 Short	No function ★
2-3 Short	Clear CMOS

JP5: Case Open detection

JP5	Function
short	Case open enable
open	No function ★

J8 COM1 RIfunction Selection

J8	Function
3-4 short	RI# ★
3-1 short	5V
3-5 short	12V

J9 COM2 RI#function Selection

J9	Function
3-4 short	RI# ★
3-1 short	5V
3-5 short	12V

2.2 Connector Allocation

I/O peripheral devices are connected to the interface connectors.

Connector Function List

Connector	Function	Remark
J1A	COM1	
J1B	COM2	
J2	Display port	
J3	VGA	
J4	Audio jack	
J5	HDMI connector	
J6	USB 3.0 X2 + RJ-45(I217)	
J7	USB 3.0 X2 + RJ-45(I210)	
J10	KB/MS	
J11	PCIE 2X1 gold finger	
J12	COM6	
JP2	COM4	
J13	Mini PCIE	
J14	COM3	
J15	COM5	
J16	GPIO	
J17	ATX 2X2 power connector	
J18	ATX 24 pin power connector	
J19	battery connector	
J20	PCIE X16 slot	
J21	front panel control header	
J22/J23/J24	USB header	
J25/J26/J28/J29	SATA3 connector	
J27	TPM	
J31	CPU fan	
J32	System fan	
J33/J34	DDR3 slot	

Pin Assignments of Connectors

J1: COM1&COM2

J1A:COM1 Serial Port

PIN No.	Signal Description
1	DCD#1
2	RXD#1
3	TXD#1
4	DTR#1
5	GND
6	DSR#1
7	RTS#1
8	CTS#1
9	RI#1

J1B:COM2 Serial Port

PIN No.	Signal Description
1	DCD#2/DT-
2	RXD#2/DT+
3	TXD#2/422R+
4	DTR#2/422R-
5	GND
6	DSR#2
7	RTS#2
8	CTS#2
9	RI#2

J2:Display port Connector

PIN No.	Signal Description	PIN No.	Signal Description
1	D0+	2	GND
3	D0-	4	D1+
5	GND	6	D1-
7	D2+	8	GND
9	D2-	10	D3+
11	GND	12	D3-
13	AUX_EN#	14	GND
15	AUX+	16	GND
17	AUX-	18	Hot plug
19	GND	20	VCC3

J3:VGA Connector

PIN No.	Signal Description	PIN No.	Signal Description
1	Red	2	Green
3	Blue	4	NC
5	GND	6	RGND
7	GGND	8	BGND
9	KEY(+5V)	10	SGND
11	NC	12	SDA
13	H Sync	14	V Sync
15	SCL	16	

J5:HDMI Connector

PIN No.	Signal Description	PIN No.	Signal Description
1	D0+	2	GND
3	D0-	4	D1+
5	GND	6	D1-
7	D2+	8	GND
9	D2-	10	D3+
11	GND	12	D3-
13	NC	14	NC
15	DDCCLK	16	DDCDATA
17	GND	18	VCC5
19	HPD		

J10:PS/2 Keyboard/Mouse Pin Header

PIN No.	Signal Description	PIN No.	Signal Description
1	Mouse Data	2	Keyboard Data
3	N/C	4	N/C
5	Ground	6	Ground
7	PS2 Power	8	PS2 Power
9	Mouse Clock	10	Keyboard Clock

J11:PCIE GOLD FINGER

PIN No.	Signal Description	PIN No.	Signal Description
B1	12V	A1	SMBCLK
B2	12V	A2	12V
B3	VCC3	A3	12V
B4	GND	A4	GND
B5	CLK_CF2_PCIE_DP	A5	PCIE_TX6_DP
B6	CLK_CF2_PCIE_DN	A6	PCIE_TX6_DN
B7	GND	A7	PCIE_RX6_DP
B8	VCC3	A8	PCIE_RX6_DN
B9	VCC3	A9	VCC3

PIN No.	Signal Description	PIN No.	Signal Description
B10	3VSB	A10	VCC3
B11	PCIE_WAKE#	A11	PCIRST
B12	SMBDAT	A12	GND
B13	GND	A13	CLK_CF2_PCIE_DP
B14	PCIE_TX7_DP	A14	CLK_CF2_PCIE_DN
B15	PCIE_TX7_DN	A15	GND
B16	GND	A16	PCIE_RX7_DP
B17	VCC3	A17	PCIE_RX7_DN
B18	GND	A18	GND

J12:COM6 Serial Port Pin Header

PIN No.	Signal Description
1	DCD#6
2	RXD#6/DT+
3	TXD#6/422R+
4	DTR#6
5	GND
6	DSR#6
7	RTS#6
8	CTS#6
9	RI#6
10	N/C

J14:COM3 Serial Port Pin Header

PIN No.	Signal Description
1	DCD#3
2	RXD#3
3	TXD#3
4	DTR#3
5	GND
6	DSR#3
7	RTS#3
8	CTS#3
9	RI#3
10	N/C

JP2:COM4 Serial Port Pin Header

PIN No.	Signal Description
1	DCD#4
2	RXD#4
3	TXD#4
4	DTR#4
5	GND
6	DSR#4
7	RTS#4
8	CTS#4
9	RI#4
10	N/C

J15:COM5 Serial Port Pin Header

PIN No.	Signal Description
1	DCD#5
2	RXD#5
3	TXD#5
4	DTR#5
5	GND
6	DSR#5
7	RTS#5
8	CTS#5
9	RI#5
10	N/C

J16:GPIO Pin Header

PIN No.	Signal Description	PIN No.	Signal Description
1	GPIO0	2	GPIO4
3	GPIO1	4	GPIO5
5	GPIO2	6	GPIO6
7	GPIO3	8	GPIO7
9	Ground	10	+5V

J17:ATX 2X2 power connector

Pin No.	Signal Description
1	GND
2	GND
3	+12V
4	+12V

J21:Front Panel Pin Header

PIN No.	Signal Description	PIN No.	Signal Description
1	VCC	2	5VSB
3	SATA_LED#	4	POWER_LED
5	GND	6	Power Button
7	RSTBTN#	8	GND
9	VCC	10	BUZZER
11	GND	12	GND
13	VCC	14	NC

1-3 SATA LED、2-4 Power LED
5-7 Reset Button、6-8 Power Button、9-10 Buzzer

J22/J23/J24/:USB2.0 Pin Header

PIN No.	Signal Description	PIN No.	Signal Description
1	5V Dual	2	5V Dual
3	USB-	4	USB-
5	USB+	6	USB+
7	Ground	8	Ground
9	Key	10	N/C

J26:SMBUS Pin Header

PIN No.	Signal Description
1	SMBus_CLK
2	N/C
3	Ground
4	SMBus_DAT
5	+5V

J27:TPM Pin Header

PIN No.	Signal Description	PIN No.	Signal Description
1	PCLK_TPM	2	GND
3	LFRAME#	4	X
5	SIO2_PLTRST#	6	VCC
7	LAD3	8	LAD2
9	VCC3	10	LAD1
11	LAD0	12	GND
13	SMB_CLK_MAIN	14	SMB_DATA_MAIN
15	3VSB	16	SERIRQ
17	GND	18	X
19	LPCPD#	20	X

J31:CPU Fan Connector

PIN No.	Signal Description
1	Ground
2	+12V
3	Sense output
4	FAN PWM_CONTROL

J32:System Fan Connector

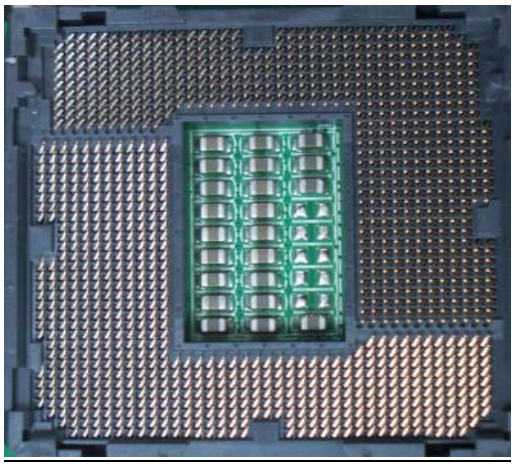
PIN No.	Signal Description
1	Ground
2	FAN PWM_CONTROL
3	Sense output

Chapter 3
System Installation

This chapter provides you with instructions to set up your system. The additional information is enclosed to help you set up onboard PCI device and handle Watch Dog Timer (WDT) and operation of GPIO in software programming.

3.1 Intel Haswell Processor

LGA-1150 CPU Socket



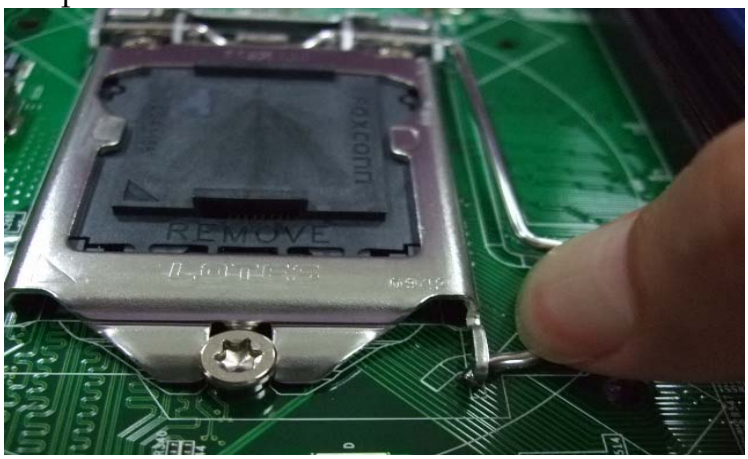
LGA-1150 CPU

Please remember to locate the alignment keys on the CPU socket of the motherboard and the notches on the CPU.

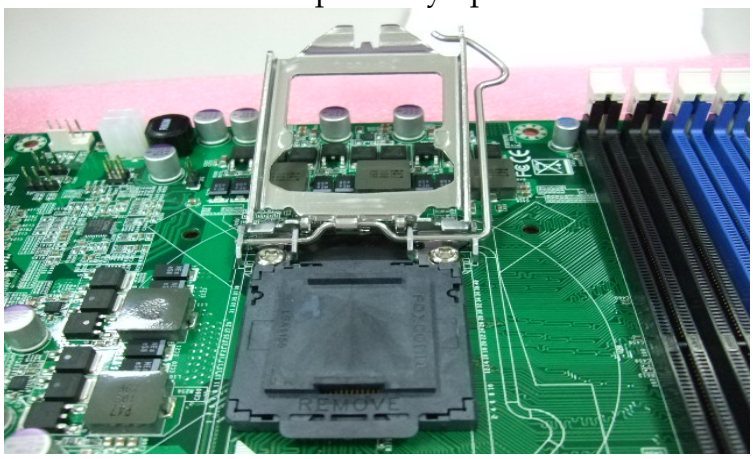
LGA-1150 CPU Installation Steps

Before install the CPU, please make sure to turn off the power first!!

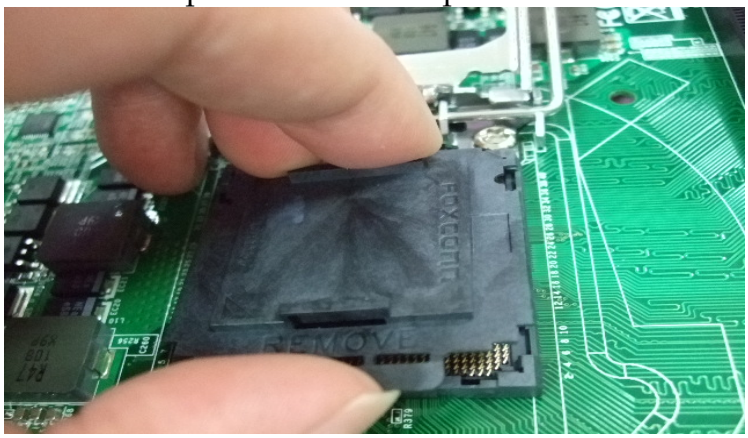
1. Open the load lever.



2. Lift the load lever up to fully open.



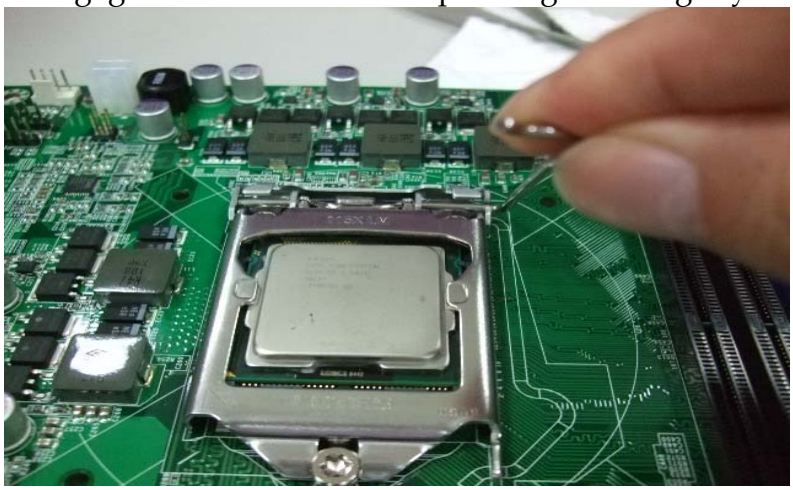
3. Remove the plastic cap on the CPU socket. Before you install the CPU, always cover it to protect the socket pin.



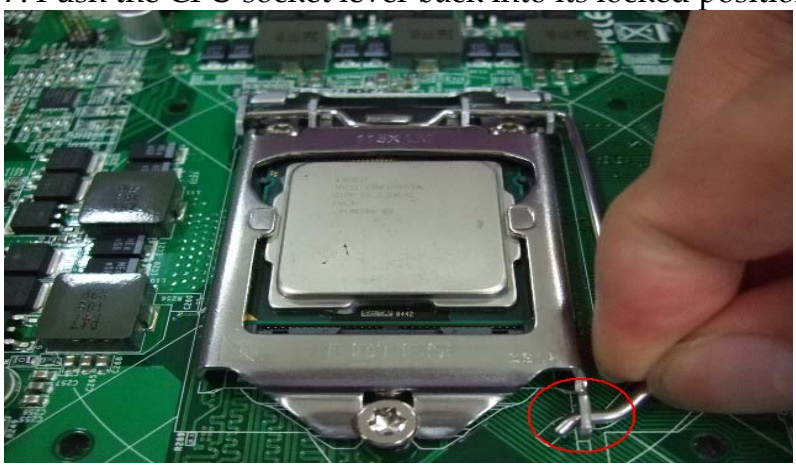
4. After confirming the CPU direction for correct mating, put down the CPU in the
socket housing frame. Note that alignment keys are matched.

5. Make sure the CPU has been seated well into the socket. If not, take out the CPU
and reinstall.

6. Engage the load lever while pressing down lightly onto the load plate.



7. Push the CPU socket lever back into its locked position.



8. Please make sure four hooks are in proper position before you install the cooler.

3.2 Main Memory

WADE-8015 has two 240 pin DIMM sockets which supports Dual channel 1333/1600 DDR3-SDRAM as main memory, Non-ECC (Error Checking and Correcting), non-register functions. The maximum memory can be up to 16GB. Memory clock and related settings can be detected by BIOS via SPD interface.

For system compatibility and stability, do not use memory module without brand. Memory configuration can be set to either one double-sided DIMM in one DIMM socket or two single-sided DIMM in both sockets.

Beware of the connection and lock integrity from memory module to socket. Inserting improperly it will affect the system reliability.

Before locking, make sure that all modules have been fully inserted into the card slots.

Note:
To insure the system stability, please do not change any of DRAM parameters in BIOS setup to modify system the performance without acquired technical information.

3.3 Installing the Mini-ITX Board Computer

To install your WADE-8015 into standard chassis or proprietary environment, please perform the following:

Step 1 : Check all jumpers setting on proper position
Step 2 : Install and configure CPU and memory module on right position
Step 3 : Place WADE-8015 into the dedicated position in the system
Step 4 : Attach cables to existing peripheral devices and secure it

WARNING
Please ensure that SBC is properly inserted and fixed by mechanism.

Note
Please refer to section 3.3.1 to 3.3.4 to install INF/VGA/LAN/Audio drivers.

3.3.1 Chipset Component Driver

WADE-8015 uses Intel® Lynx Point. It's a new chipset that some old operating systems might not be able to recognize. To overcome this compatibility issue, for Windows Operating Systems such as Windows 7, please install its INF before any of other Drivers are installed. You can find very easily this chipset component driver in WADE-8015 CD-title.

3.3.2 Intel® Integrated Graphics Controller

Processor integrated 3D graphics Media Accelerator. WADE-8015 uses Intel® Lynx Point integrated graphic chipset to gain an outstanding graphic performance. WADE-8015 supports VGA, DVI-D, and HDMI display output. It can select two of them to use dual display function. This combination makes WADE-8015 an excellent piece of multimedia hardware.

Drivers Support
Please find the Graphic drivers in the WADE-8015 CD-title. Drivers support Windows 7.

3.3.3 On-board Gigabit Ethernet Controller

Drivers Support
Please find Intel WGI218LM and WGI210AT LAN driver in /Ethernet directory of WADE-8015 CD-title. The drivers support Windows 7.

3.3.4 Audio Controller

Please find Realtek ALC886 (High Definition Audio driver) from WADE-8015 CD-title. The drivers support Windows 7.

3.4 Clear CMOS Operation

The following table indicates how to enable/disable Clear CMOS Function hardware circuit by putting jumpers at proper position.

JP4: Clear CMOS Header

JP4	Function
1-2 short	No function ★
2-3 short	Clear CMOS

3.5 WDT Function

```
#include <stdio.h>
#include <conio.h>
#include <dos.h>

#define SIO_Port 0x2E
#define  SIO_Port2          0x4E
#define GPIO_LDN          0x07

void Enter_IT872x_SIO() {
        outportb(SIO_Port, 0x87);
        outportb(SIO_Port, 0x01);
        outportb(SIO_Port, 0x55);
        outportb(SIO_Port, 0x55);

}

void Set_LDN(unsigned char LDN) {
        outportb(SIO_Port, 0x07);
        outportb(SIO_Port+1, LDN);
        printf("LDN=%x\n", LDN);
}

void Set_Register(unsigned char offset, unsigned char value) {
        outportb(SIO_Port, offset);
        outportb(SIO_Port+1, value);
        printf("Write offset:%x = %x\n", offset, value);
}

int main(void) {

        printf("test string\n");
        Enter_IT872x_SIO();
        Set_LDN(GPIO_LDN);
```

```
        Set_Register(0x72, 0xC0);
        Set_Register(0x73, 0x05);
        printf("System will reset in 5 seconds\n");

        return 0;
}
```

3.6 GPIO

```
/* This File was created by GPIO APP,Please don`t EDIT*/
/*****************************************************
 Sample Code for ITE series SIO GPIO Access

 SIO IO INDEX : 0x2E
 GPIO IO BASE : 0x1818
 GPIO PIN Define:
 Pin 1 : GP15
 Pin 2 : GP16
 Pin 3 : GP47
 Pin 4 : GP50
 Pin 5 : GP14
 Pin 6 : GP35
 Pin 7 : GP36
 Pin 8 : GP37
*****************************************************/
#include <stdio.h>
#include <conio.h>
#include <string.h>
#include <dos.h>

/*****************************************************
  Common defines
*****************************************************/
#define HIGH 1
#define LOW  0
#define IN   1
#define OUT  0

/*===========================================================
  Prototype defines
===========================================================*/
int Get_IT8728_GPIOBase(
 int IOINDEX
);
```

```
void Enter_IT8728_SIO(
 int IOINDEX
);

void Exit_IT8728_SIO(
 int IOINDEX
);

void Set_IT8728_LDN(
 int IOINDEX,
 int LDN
);

int Get_IT8728_Byte_Val(
 int IOINDEX,
 int offset
);

void Set_IT8728_Byte_Val(
 int IOINDEX,
 int offset,
 int Data
);

/*****************************************************
 MAIN Code Start
*****************************************************/
int main()
{
        return;
}

/*****************************************************
Procedure Name : Get Super IO GPIO Base address
Check defines in config file name

input 1 : INT IOINDEX
return  : GPIO BASE
*****************************************************/
int Get_IT8728_GPIOBase(
 int IOINDEX
)
{
int IODATA = IOINDEX + 1;
int GPIOBASE;
```

```
//SIO Enter Key
Enter_IT8728_SIO(IOINDEX);
//Change LDN to 7 (GPIO)
Set_IT8728_LDN(IOINDEX,0x07);
//Get GPIO BASE
GPIOBASE = Get_IT8728_Byte_Val(IOINDEX,0x62) * 0x100;
GPIOBASE = GPIOBASE + Get_IT8728_Byte_Val(IOINDEX,0x63);
return GPIOBASE;
}

/*****************************************************
Procedure Name : Enter IT8728 Super IO
Check defines in config file name

input 1 : INT IOINDEX
*****************************************************/
void Enter_IT8728_SIO(
 int IOINDEX
)
{
int IODATA = IOINDEX + 1;

outportb(IOINDEX,0x87);
outportb(IOINDEX,0x01);
outportb(IOINDEX,0x55);
outportb(IOINDEX,0x55);
return;
}

/*****************************************************
Procedure Name : Exit IT8728 Super IO
Check defines in config file name

input 1 : INT IOINDEX
*****************************************************/
void Exit_IT8728_SIO(
 int IOINDEX
)
{
int IODATA = IOINDEX + 1;

outportb(IOINDEX,0x02);
outportb(IODATA ,0x02);
return;
}
```

```
/*****************************************************
Procedure Name : Change IT8728 LDN
Description    : Change Super IO Logical Device Number

input 1 : INT IOINDEX
input 2 : INT LDN(Logical Device Numbaer)
*****************************************************/
void Set_IT8728_LDN(
 int IOINDEX,
 int LDN
)
{
int IODATA = IOINDEX +   1;

outportb(IOINDEX,0x07);
outportb(IODATA, LDN);
return;
}

/*****************************************************
Procedure Name : Get IT8728 offset data
Description    : Get IT8728 offset byte data

input 1 : INT IOINDEX
input 2 : INT offset
return  : INT Data (Byte)
*****************************************************/
int Get_IT8728_Byte_Val(
 int IOINDEX,
 int offset
)
{
int Data;
int IODATA = IOINDEX + 1;

outportb(IOINDEX,offset);             //set offset of data read
Data = inportb(IODATA);                        //Get Data from offset
return Data;
}

/*****************************************************
Procedure Name : Set IT8728 offset data
Description    : Set Byte data to IT8728 offset

input 1 : INT IOINDEX
```

```
input 2 : INT offset
input 3 : INT Data
*****************************************************/
void Set_IT8728_Byte_Val(
 int IOINDEX,
 int offset,
 int Data
)
{
int IODATA = IOINDEX + 1;

outportb(IOINDEX,offset);
outportb(IODATA, Data);
return;
}

/*****************************************************
Procedure Name : Set GPIO Pin 1 Mode & In/Out data
Description    : Set GPIO Pin I/O Mode
            if GPIOMode is Input , input 2 data will
            dont care. and this function will return
            read value.
Pin 1   : GP15

input 1 : INT GPIOMode
input 2 : INT Data
Out 1   : INT Data
*****************************************************/
int SET_GPIO_PIN1(
int GPIOMode,
int Data
)
{
            //GPIO Mode is Output
            if(GPIOMode = 0){
                        Set_IT8728_Byte_Val(0x2E,0xC8,
Get_IT8728_Byte_Val(0x2E,0xC8) | (1<<5));

                        //if Data is HIGH
                        if(Data==1){
                        outportb(0x1818 + 0, 1<<5 );
                        }
                        //if Data is LOW
                        if(Data==0){
                        outportb(0x1818 + 0, (inportb(0x1818 + 0) & ~(1<<5) ) );
                        }
```

```
                return NULL;
        }
        //GPIO Mode is Input
        else if(GPIOMode = 1){
                Set_IT8728_Byte_Val(0x2E,0xC8,
Get_IT8728_Byte_Val(0x2E,0xC8) & ~(1<<5));

                Data = inportb(0x1818 + 0) & (1<<5);
                return    Data;
        }

        return NULL;
}

/*****************************************************
Procedure Name : Set GPIO Pin 2 Mode & In/Out data

Description    : Set GPIO Pin I/O Mode
          if GPIOMode is Input , input 2 data will
          dont care. and this function will return
          read value.
Pin 2   : GP16

input 1 : INT GPIOMode
input 2 : INT Data
Out 1   : INT Data
*****************************************************/
int SET_GPIO_PIN2(
int GPIOMode,
int Data
)
{
        //GPIO Mode is Output
        if(GPIOMode = 0){
                Set_IT8728_Byte_Val(0x2E,0xC8,
Get_IT8728_Byte_Val(0x2E,0xC8) | (1<<6));

                //if Data is HIGH
                if(Data==1){
                outportb(0x1818 + 0, 1<<6 );
                }
                //if Data is LOW
                if(Data==0){
                outportb(0x1818 + 0, (inportb(0x1818 + 0) & ~(1<<6) ) );
                }
                return NULL;
```

```
        }
        //GPIO Mode is Input
        else if(GPIOMode = 1){
                Set_IT8728_Byte_Val(0x2E,0xC8,
Get_IT8728_Byte_Val(0x2E,0xC8) & ~(1<<6));

                Data = inportb(0x1818 + 0) & (1<<6);
                return    Data;
        }

        return NULL;
}

/*****************************************************
Procedure Name : Set GPIO Pin 3 Mode & In/Out data

Description    : Set GPIO Pin I/O Mode
          if GPIOMode is Input , input 2 data will
          dont care. and this function will return
          read value.
Pin 3   : GP47

input 1 : INT GPIOMode
input 2 : INT Data
Out 1   : INT Data
*****************************************************/
int SET_GPIO_PIN3(
int GPIOMode,
int Data
)
{
        //GPIO Mode is Output
        if(GPIOMode = 0){
                Set_IT8728_Byte_Val(0x2E,0xCB,
Get_IT8728_Byte_Val(0x2E,0xCB) | (1<<7));

                //if Data is HIGH
                if(Data==1){
                outportb(0x1818 + 3, 1<<7 );
                }
                //if Data is LOW
                if(Data==0){
                outportb(0x1818 + 3, (inportb(0x1818 + 3) & ~(1<<7) ) );
                }
                return NULL;
        }
```

```
	//GPIO Mode is Input
	else if(GPIOMode = 1){
		Set_IT8728_Byte_Val(0x2E,0xCB,
Get_IT8728_Byte_Val(0x2E,0xCB) & ~(1<<7));

		Data = inportb(0x1818 + 3) & (1<<7);
		return	Data;
	}

	return NULL;
}

/*****************************************************
Procedure Name : Set GPIO Pin 4 Mode & In/Out data

Description	: Set GPIO Pin I/O Mode
		  if GPIOMode is Input , input 2 data will
		  dont care. and this function will return
		  read value.
Pin 4	: GP50

input 1 : INT GPIOMode
input 2 : INT Data
Out 1	: INT Data
*****************************************************/
int SET_GPIO_PIN4(
int GPIOMode,
int Data
)
{
	//GPIO Mode is Output
	if(GPIOMode = 0){
		Set_IT8728_Byte_Val(0x2E,0xCC,
Get_IT8728_Byte_Val(0x2E,0xCC) | (1<<0));

		//if Data is HIGH
		if(Data==1){
		outportb(0x1818 + 4, 1<<0 );
		}
		//if Data is LOW
		if(Data==0){
		outportb(0x1818 + 4, (inportb(0x1818 + 4) & ~(1<<0) ) );
		}
		return NULL;
	}
	//GPIO Mode is Input
```

```
        else if(GPIOMode = 1){
                Set_IT8728_Byte_Val(0x2E,0xCC,
Get_IT8728_Byte_Val(0x2E,0xCC) & ~(1<<0));

                Data = inportb(0x1818 + 4) & (1<<0);
                return    Data;
        }
        return NULL;
}

/*****************************************************
Procedure Name : Set GPIO Pin 5 Mode & In/Out data

Description    : Set GPIO Pin I/O Mode
          if GPIOMode is Input , input 2 data will
          dont care. and this function will return
          read value.
Pin 5   : GP14

input 1 : INT GPIOMode
input 2 : INT Data
Out 1   : INT Data
*****************************************************/
int SET_GPIO_PIN5(
int GPIOMode,
int Data
)
{
        //GPIO Mode is Output
        if(GPIOMode = 0){
                Set_IT8728_Byte_Val(0x2E,0xC8,
Get_IT8728_Byte_Val(0x2E,0xC8) | (1<<4));

                //if Data is HIGH
                if(Data==1){
                outportb(0x1818 + 0, 1<<4 );
                }
                //if Data is LOW
                if(Data==0){
                outportb(0x1818 + 0, (inportb(0x1818 + 0) & ~(1<<4) ) );
                }
                return NULL;
        }
        //GPIO Mode is Input
        else if(GPIOMode = 1){
```

```
                    Set_IT8728_Byte_Val(0x2E,0xC8,
Get_IT8728_Byte_Val(0x2E,0xC8) & ~(1<<4));

                    Data = inportb(0x1818 + 0) & (1<<4);
                    return    Data;
          }
          return NULL;
}

/*****************************************************
Procedure Name : Set GPIO Pin 6 Mode & In/Out data

Description    : Set GPIO Pin I/O Mode
          if GPIOMode is Input , input 2 data will
          dont care. and this function will return
          read value.
Pin 6   : GP35

input 1 : INT GPIOMode
input 2 : INT Data
Out 1   : INT Data
*****************************************************/
int SET_GPIO_PIN6(
int GPIOMode,
int Data
)
{
          //GPIO Mode is Output
          if(GPIOMode = 0){
                    Set_IT8728_Byte_Val(0x2E,0xCA,
Get_IT8728_Byte_Val(0x2E,0xCA) | (1<<5));

                    //if Data is HIGH
                    if(Data==1){
                    outportb(0x1818 + 2, 1<<5 );
                    }
                    //if Data is LOW
                    if(Data==0){
                    outportb(0x1818 + 2, (inportb(0x1818 + 2) & ~(1<<5) ) );
                    }
                    return NULL;
          }
          //GPIO Mode is Input
          else if(GPIOMode = 1){
                    Set_IT8728_Byte_Val(0x2E,0xCA,
Get_IT8728_Byte_Val(0x2E,0xCA) & ~(1<<5));
```

```
                Data = inportb(0x1818 + 2) & (1<<5);
                return    Data;
        }
        return NULL;
}

/*****************************************************
Procedure Name : Set GPIO Pin 7 Mode & In/Out data

Description    : Set GPIO Pin I/O Mode
          if GPIOMode is Input , input 2 data will
          dont care. and this function will return
          read value.
Pin 7   : GP36

input 1 : INT GPIOMode
input 2 : INT Data
Out 1   : INT Data
*****************************************************/
int SET_GPIO_PIN7(
int GPIOMode,
int Data
)
{
        //GPIO Mode is Output
        if(GPIOMode = 0){
                Set_IT8728_Byte_Val(0x2E,0xCA,
Get_IT8728_Byte_Val(0x2E,0xCA) | (1<<6));

                //if Data is HIGH
                if(Data==1){
                outportb(0x1818 + 2, 1<<6 );
                }
                //if Data is LOW
                if(Data==0){
                outportb(0x1818 + 2, (inportb(0x1818 + 2) & ~(1<<6) ) );
                }
                return NULL;
        }
        //GPIO Mode is Input
        else if(GPIOMode = 1){
                Set_IT8728_Byte_Val(0x2E,0xCA,
Get_IT8728_Byte_Val(0x2E,0xCA) & ~(1<<6));

                Data = inportb(0x1818 + 2) & (1<<6);
```

```
                return    Data;
        }
        return NULL;
}

/*****************************************************
Procedure Name : Set GPIO Pin 8 Mode & In/Out data

Description    : Set GPIO Pin I/O Mode
          if GPIOMode is Input , input 2 data will
          dont care. and this function will return
          read value.
Pin 8   : GP37

input 1 : INT GPIOMode
input 2 : INT Data
Out 1   : INT Data
*****************************************************/
int SET_GPIO_PIN8(
int GPIOMode,
int Data
)
{
        //GPIO Mode is Output
        if(GPIOMode = 0){
                Set_IT8728_Byte_Val(0x2E,0xCA,
Get_IT8728_Byte_Val(0x2E,0xCA) | (1<<7));

                //if Data is HIGH
                if(Data==1){
                outportb(0x1818 + 2, 1<<7 );
                }
                //if Data is LOW
                if(Data==0){
                outportb(0x1818 + 2, (inportb(0x1818 + 2) & ~(1<<7) ) );
                }
                return NULL;
        }
        //GPIO Mode is Input
        else if(GPIOMode = 1){
                Set_IT8728_Byte_Val(0x2E,0xCA,
Get_IT8728_Byte_Val(0x2E,0xCA) & ~(1<<7));

                Data = inportb(0x1818 + 2) & (1<<7);
                return    Data;
        }
```

```
        return NULL;
}
/* This File was created by GPIO APP,Please don`t EDIT*/
```

Chapter 4
BIOS Setup Information

WADE-8015 is equipped with the Phoenix BIOS stored in Flash ROM. These BIOS has a built-in Setup program that allows users to modify the basic system configuration easily. This type of information is stored in CMOS RAM so that it is retained during power-off periods. When system is turned on, WADE-8015 communicates with peripheral devices and checks its hardware resources against the configuration information stored in the CMOS memory. If any error is detected, or the CMOS parameters need to be initially defined, the diagnostic program will prompt the user to enter the SETUP program. Some errors are significant enough to abort the start-up.

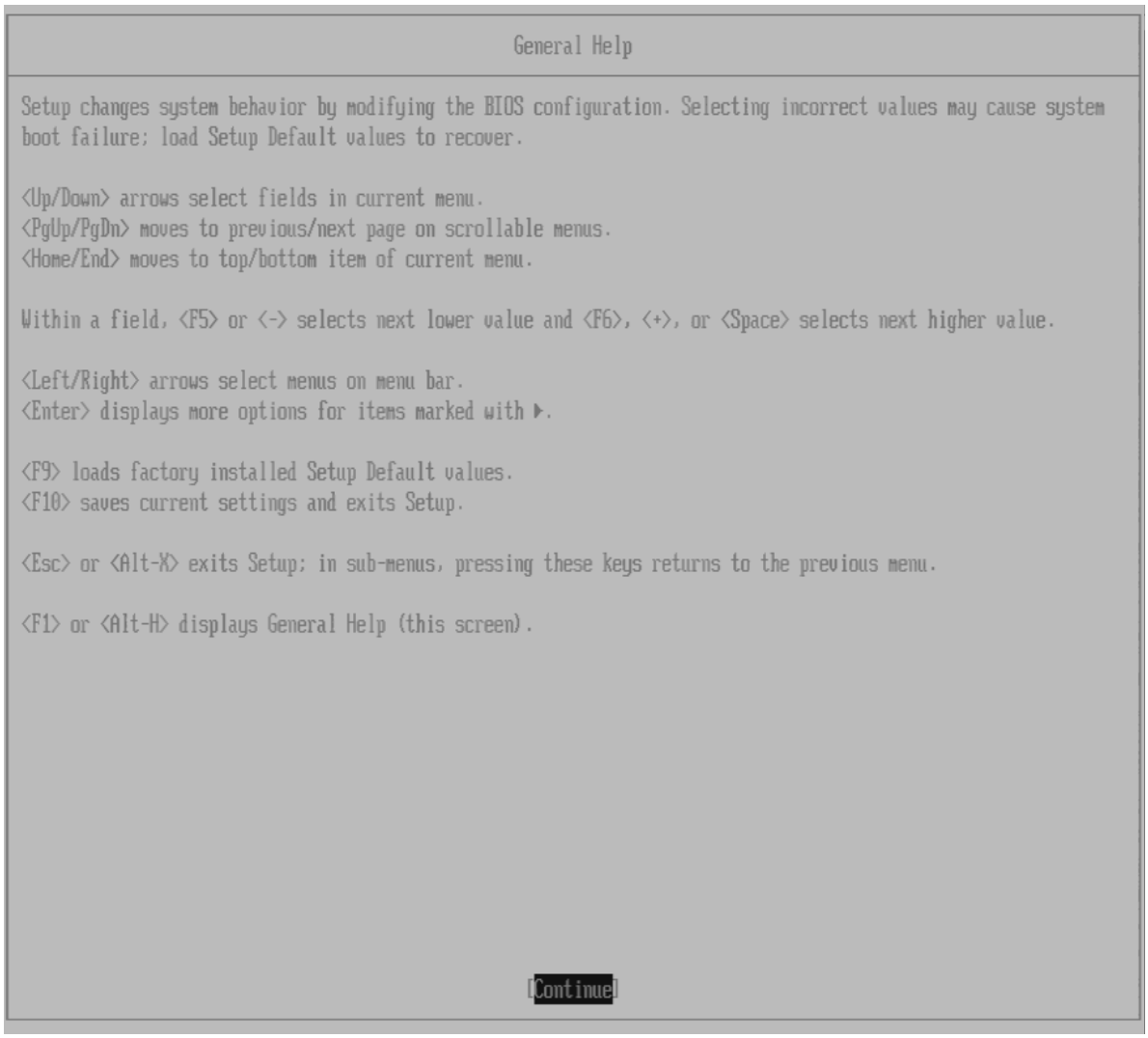
4.1 Entering Setup

Turn on or reboot the computer. When the message "Hit <F2> if you want to run SETUP" appears, press <F2> key immediately to enter BIOS setup program.

If the message disappears before you respond, but you still wish to enter Setup, please restart the system to try "COLD START" again by turning it OFF and then ON, or touch the "RESET" button. You may also restart from "WARM START" by pressing <Ctrl>, <Alt>, and <Delete> keys simultaneously. If you do not press the keys at the right time and the system will not boot, an error message will be displayed and you will again be asked to,

Press <F2> to Run SETUP or Resume

In HIFLEX BIOS setup, you can use the keyboard to choose among options or modify the system parameters to match the options with your system. The table below will show you all of keystroke functions in BIOS setup.

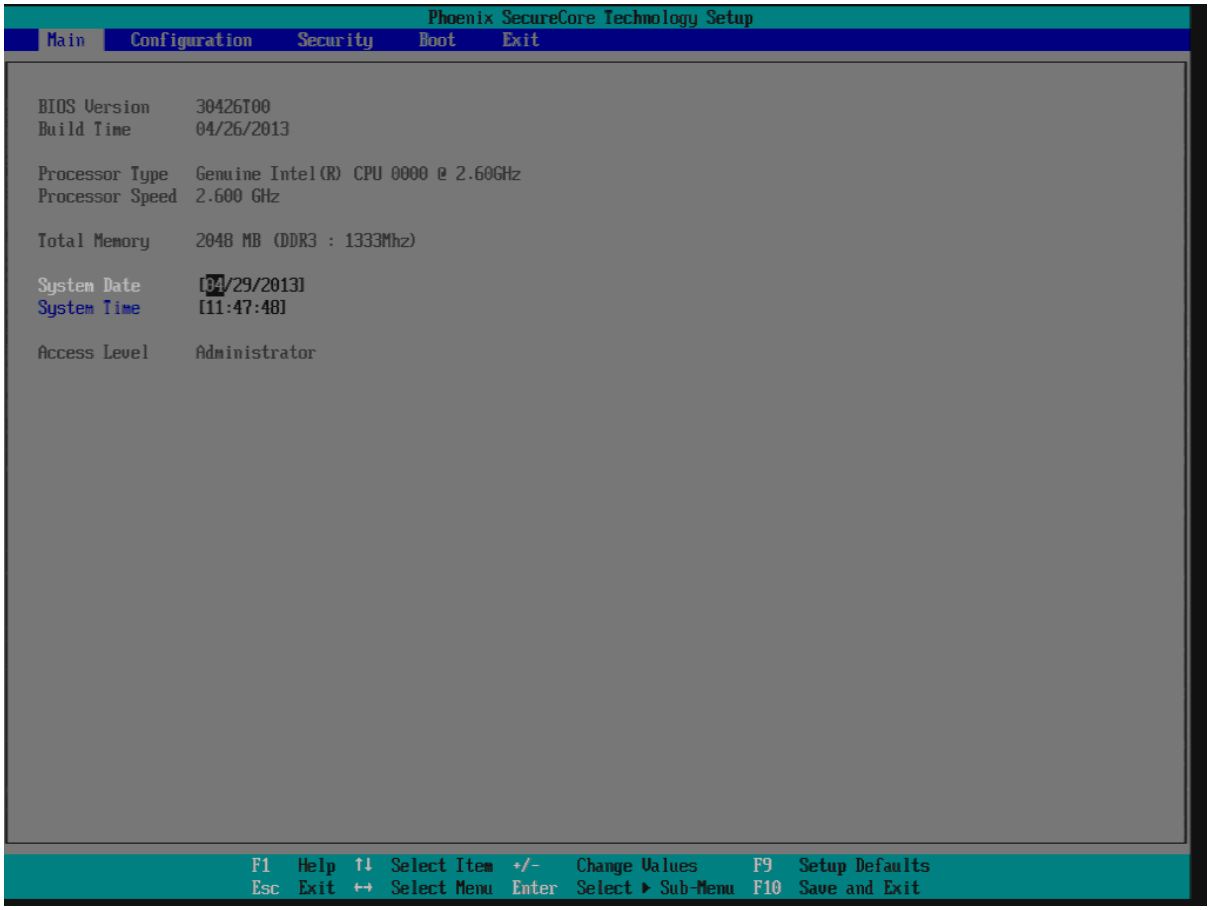

General Help
Setup changes system behavior by modifying the BIOS configuration. Selecting incorrect values may cause system boot failure; load Setup Default values to recover.
<Up/Down> arrows select fields in current menu.
<PgUp/PgDn> moves to previous/next page on scrollable menus.
<Home/End> moves to top/bottom item of current menu.
Within a field, <F5> or <-> selects next lower value and <F6>, <+>, or <Space> selects next higher value.
<Left/Right> arrows select menus on menu bar.
<Enter> displays more options for items marked with ▶.
<F9> loads factory installed Setup Default values.
<F10> saves current settings and exits Setup.
<Esc> or <Alt-X> exits Setup; in sub-menus, pressing these keys returns to the previous menu.
<F1> or <Alt-H> displays General Help (this screen).
[Continue]

4.2 Main

Once you enter WADE-8015 Phoenix BIOS CMOS Setup Utility, a Main Menu is presented. The Main Menu allows user to select from eleven setup functions and two exit choices. Use arrow keys to switch among items and press <Enter> key to accept or bring up the sub-menu.

This setup page includes all the items in standard compatible BIOS. Use the arrow keys to highlight the item and then use the <PgUp>/<PgDn> or <+>/<-> keys to select the value or number you want in each item and press <Enter> key to certify it.

Follow command keys in CMOS Setup table to change Date, Time, Drive type, and Boot Sector Virus Protection Status.


Phoenix SecureCore Technology Setup
Main
Configuration
Security
Boot
Exit
BIOS Version 30426T00
Build Time 04/26/2013
Processor Type Genuine Intel(R) CPU 0000 @ 2.60GHz
Processor Speed 2.600 GHz
Total Memory 2048 MB (DDR3 : 1333Mhz)
System Date [04/29/2013]
System Time [11:47:48]
Access Level Administrator
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit

System Data

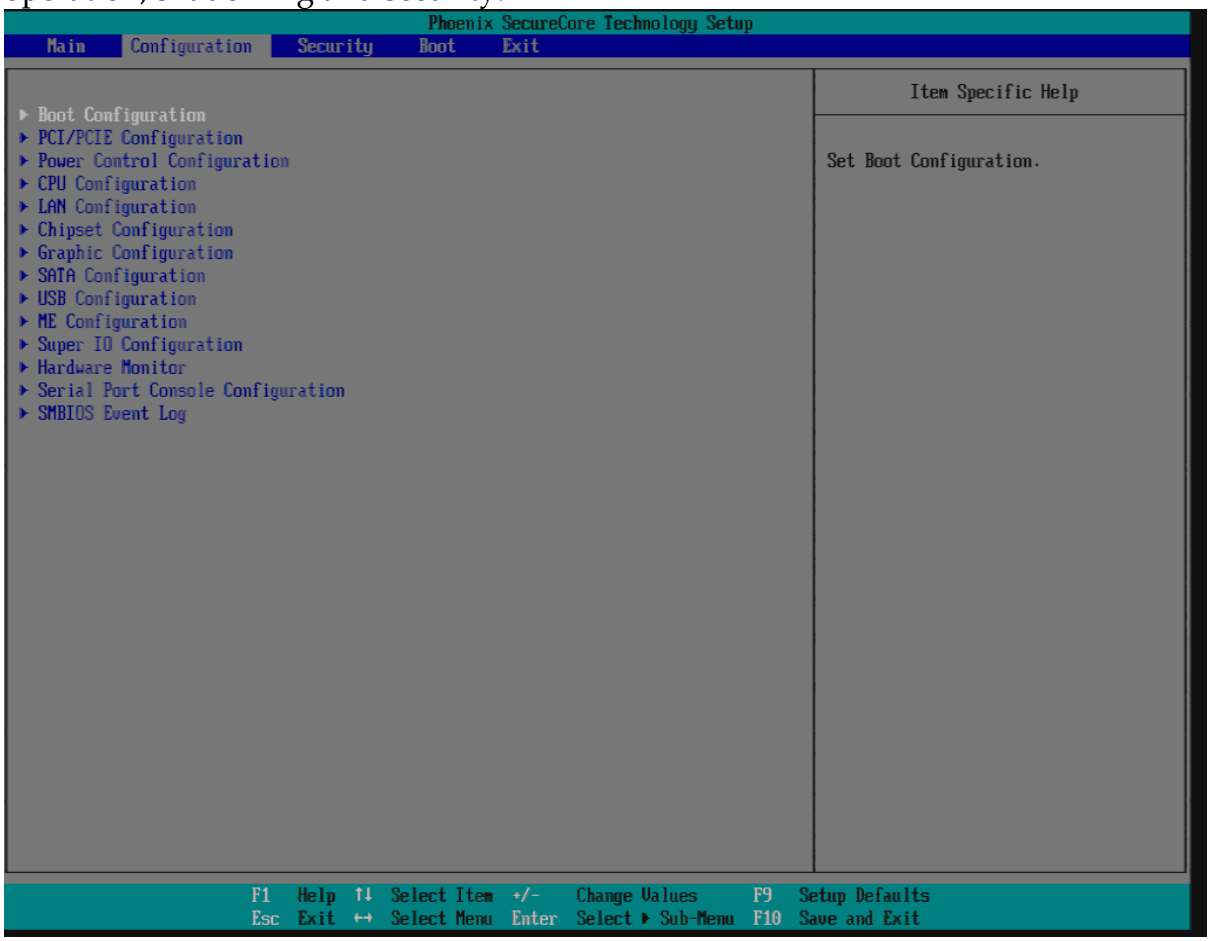
System date in the format [MM/DD/YYYY]. Use <Enter> or <Tab> to switch through the fields. Adjust the
values with <+> and <->.

System Time

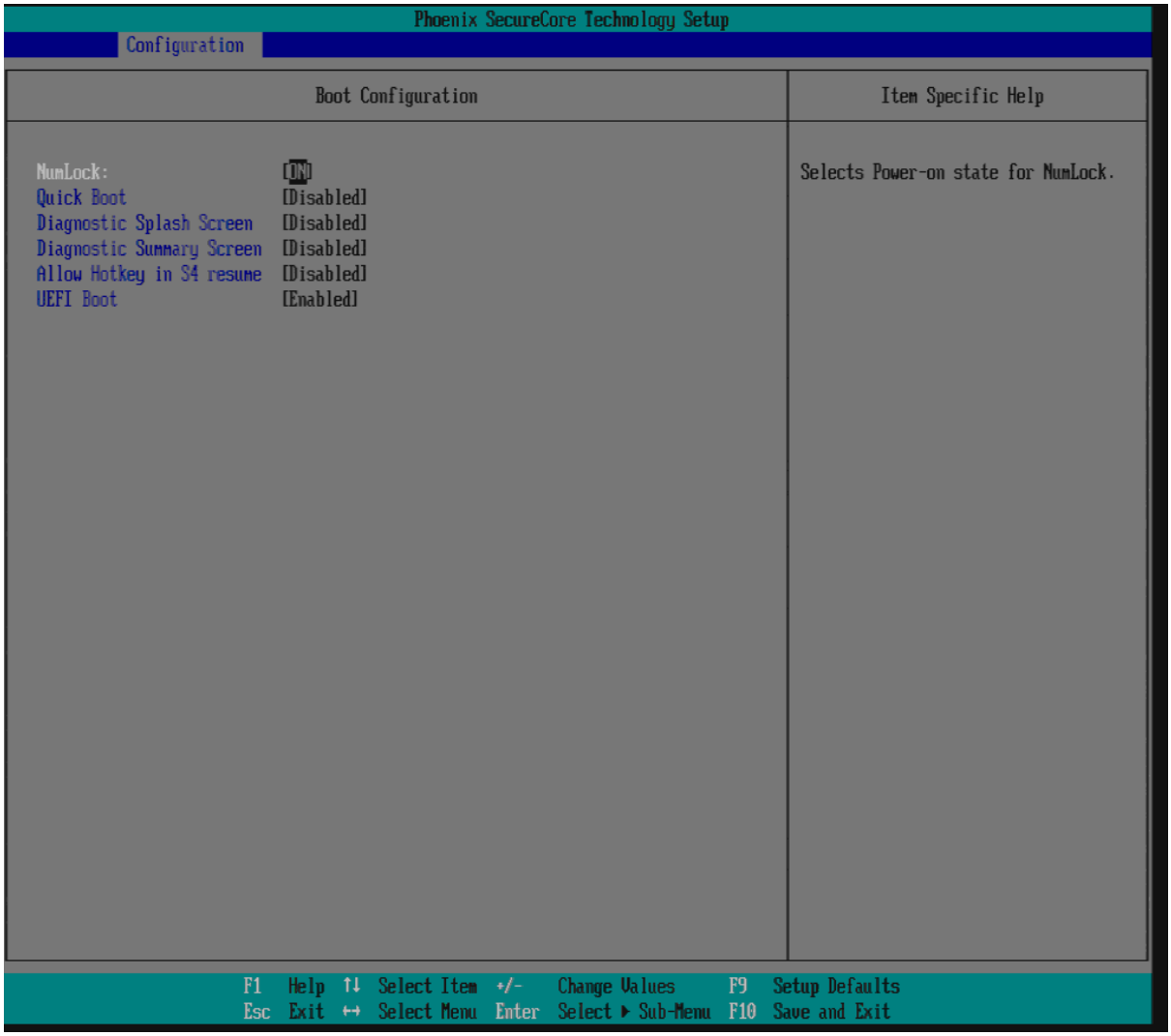
System Time is in 24-Hour format [hh:mm:ss]. Use <Enter> or <Tab> to switch through the fields. Adjust the
values with <+> and <->.

4.3 Advanced

This section allows you to configure your system for basic operation. You have the opportunity to select the system's default speed, boot-up sequence, keyboard operation, shadowing and security.



Boot Configuration


Phoenix SecureCore Technology Setup
Configuration
Boot Configuration
Item Specific Help
NumLock: [ON]
Quick Boot [Disabled]
Diagnostic Splash Screen [Disabled]
Diagnostic Summary Screen [Disabled]
Allow Hotkey in S4 resume [Disabled]
UEFI Boot [Enabled]
Selects Power-on state for NumLock.
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit

NumLock

Select the keyboard Numlock state.
Setting to [On] will turn on the Num Lock key when the system is powered on.
Setting to [Off] will allow users to use the arrow keys on the numeric keypad.
The choice: ON, OFF.

Quiet Boot

Enables or disables Quiet Boot option.
This BIOS feature determines if the BIOS should hide the normal POST messages with the motherboard or system manufacturer's full-screen logo. When it is enabled, the BIOS will display the full-screen logo during the boot-up sequence, hiding normal POST messages.
When it is disabled, the BIOS will display the normal POST messages, instead of the full-screen logo.

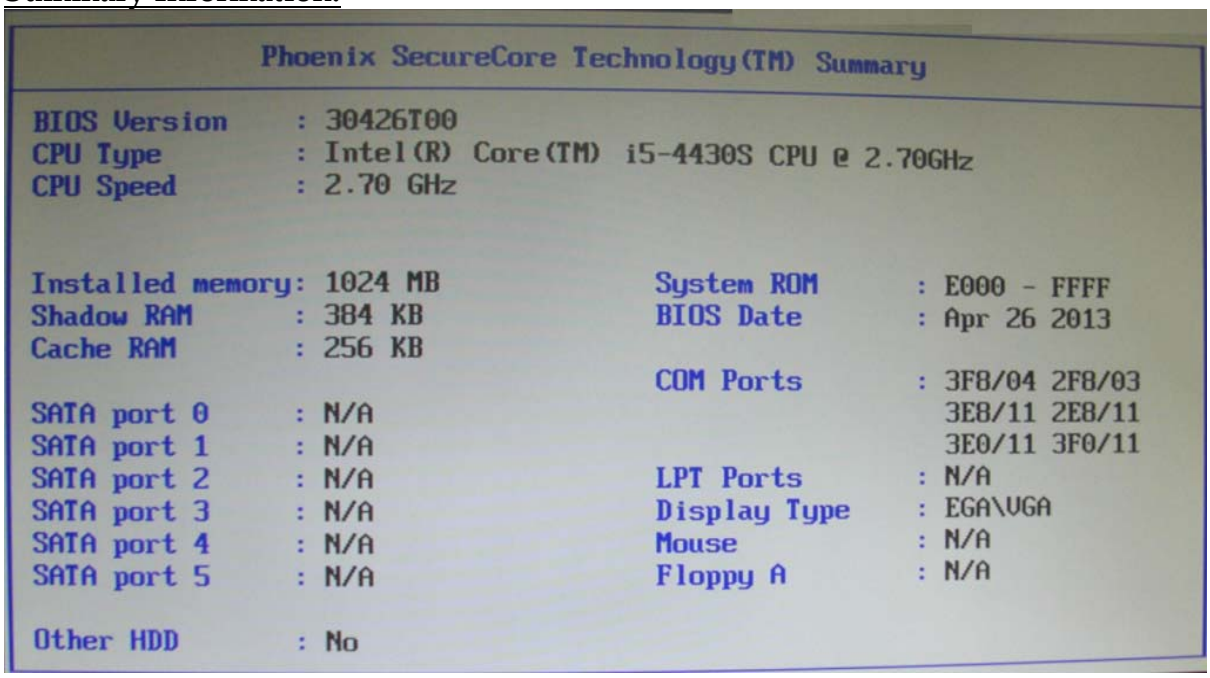
Please note that enabling this BIOS feature often adds 2-3 seconds of delay to the booting sequence. This delay ensures that the logo is displayed for a sufficient

amount of time. Therefore, it is recommended that you disabled this BIOS feature for a faster boot-up time.
Choices: Disabled, Enabled.

Diagnostic Splash Screen
This item shows a Diagnostic screen during boot up. This screen is also accessible through the App Menu.
The choice: Enabled, Disabled.

Diagnostic Summary Screen
This item shows a Diagnostic Summary Screen during boot up. The boot process will stop by displaying this screen until a key is pressed.
The choice: Enabled, Disabled.

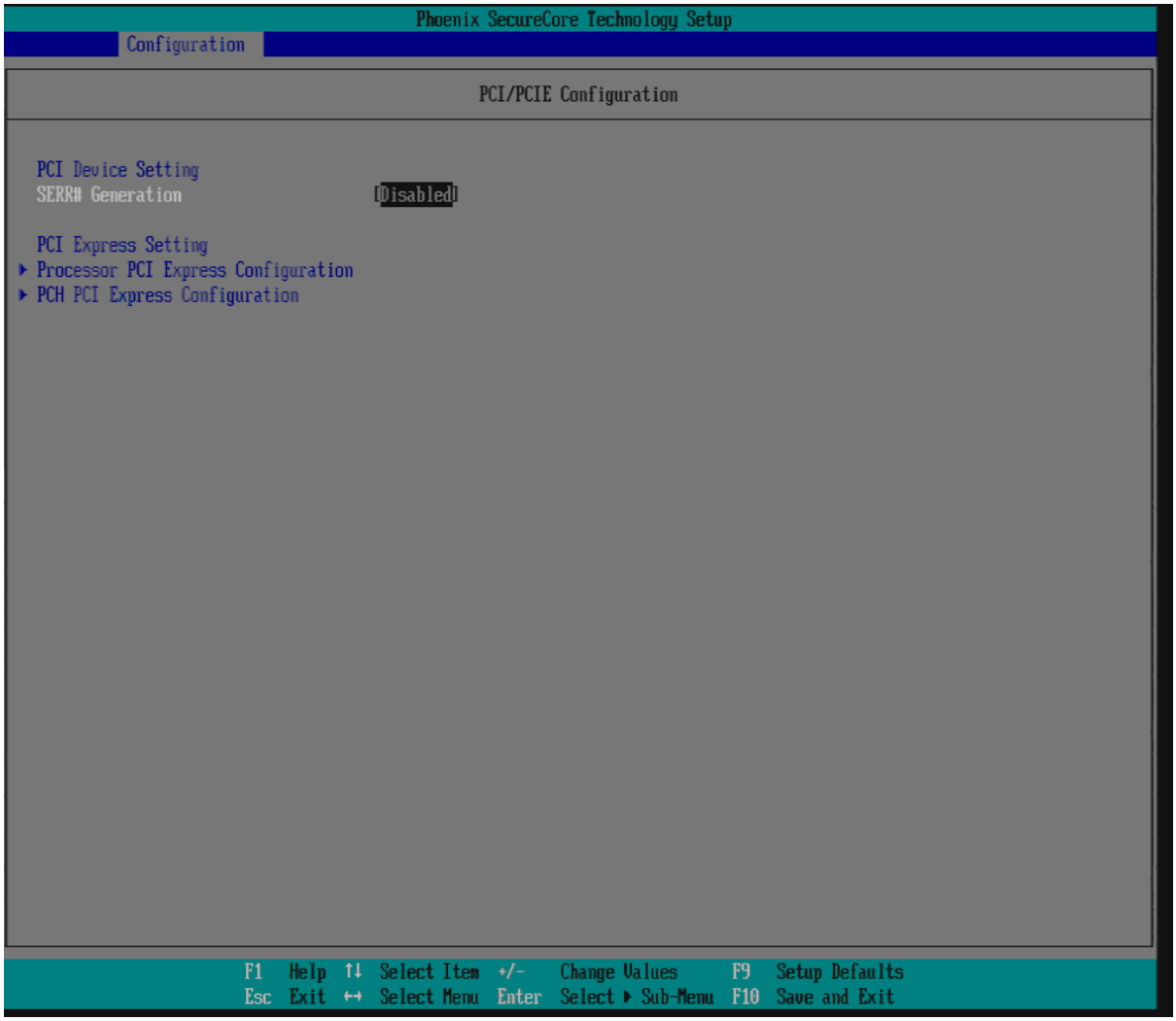
Summary Information:


Phoenix SecureCore Technology(TM) Summary
BIOS Version : 30426T00
CPU Type : Intel(R) Core(TM) i5-4430S CPU @ 2.70GHz
CPU Speed : 2.70 GHz
Installed memory: 1024 MB
Shadow RAM : 384 KB
Cache RAM : 256 KB
SATA port 0 : N/A
SATA port 1 : N/A
SATA port 2 : N/A
SATA port 3 : N/A
SATA port 4 : N/A
SATA port 5 : N/A
Other HDD : No
System ROM : E000 - FFFF
BIOS Date : Apr 26 2013
COM Ports : 3F8/04 2F8/03
3E8/11 2E8/11
3E0/11 3F0/11
LPT Ports : N/A
Display Type : EGA\VGA
Mouse : N/A
Floppy A : N/A

Allow Hotkey in S4 resume
Enable hotkey detection when system resuming from Hibernate stste.
The choice: Enabled, Disabled.

UEFI Boot
This item enables the UEFI Boot. Enable this function if you want to boot UEFI aware operation systems like Windows 7 64Bit or Linux.
The choice: Enabled, Disabled.

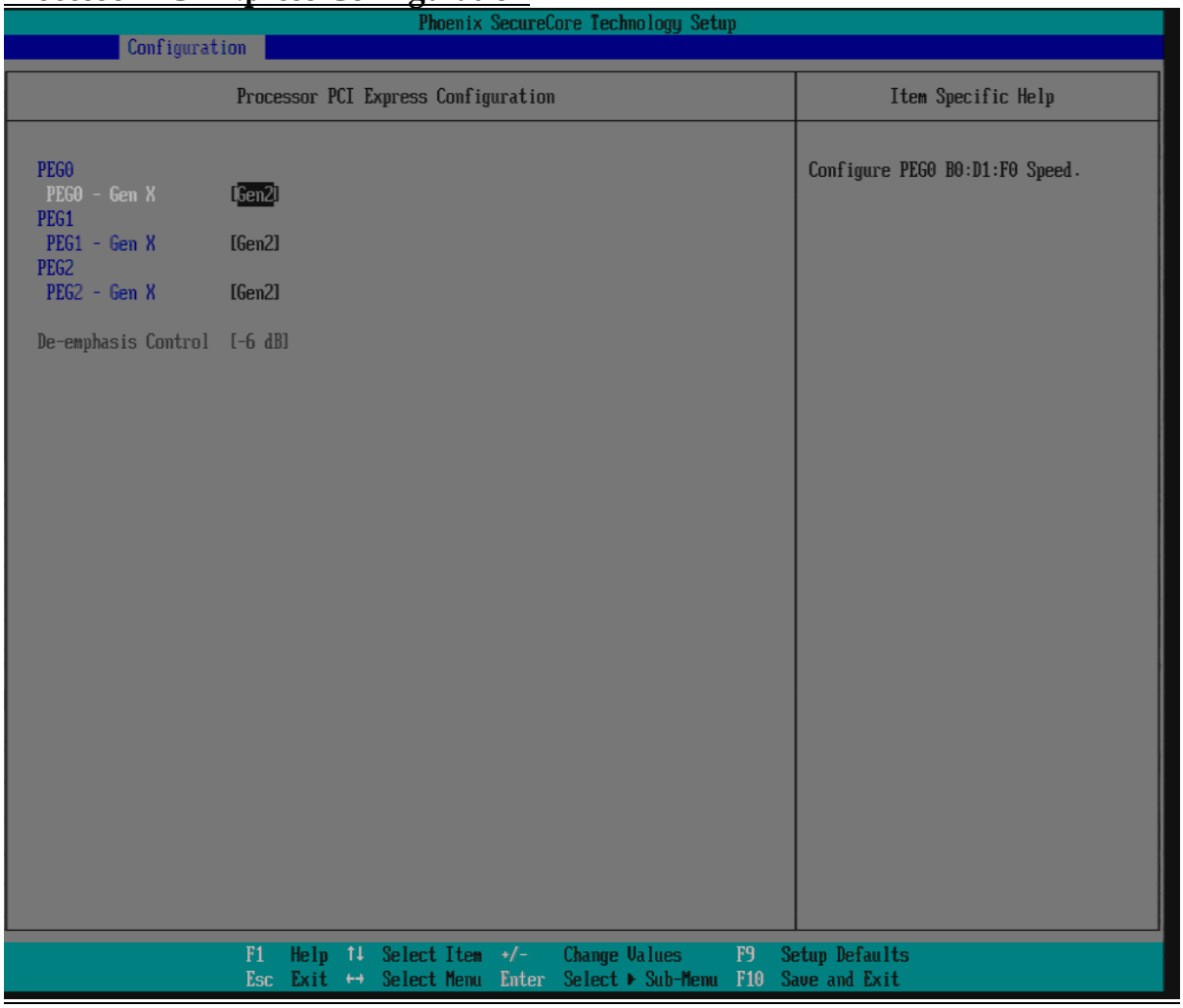
PCI/PCIE Configuration


Phoenix SecureCore Technology Setup
Configuration
PCI/PCIE Configuration
PCI Device Setting
SERR# Generation
[Disabled]
PCI Express Setting
Processor PCI Express Configuration
PCH PCI Express Configuration
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit

SERR# Generation

The choice: Enabled, Disabled.

Processor PCI Express Configuration


Phoenix SecureCore Technology Setup
Configuration
Processor PCI Express Configuration
Item Specific Help
PEG0
PEG0 - Gen X [Gen2]
PEG1
PEG1 - Gen X [Gen2]
PEG2
PEG2 - Gen X [Gen2]
De-emphasis Control [-6 dB]
Configure PEG0 B0:D1:F0 Speed.
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit

PEG0/PEG1/PEG2

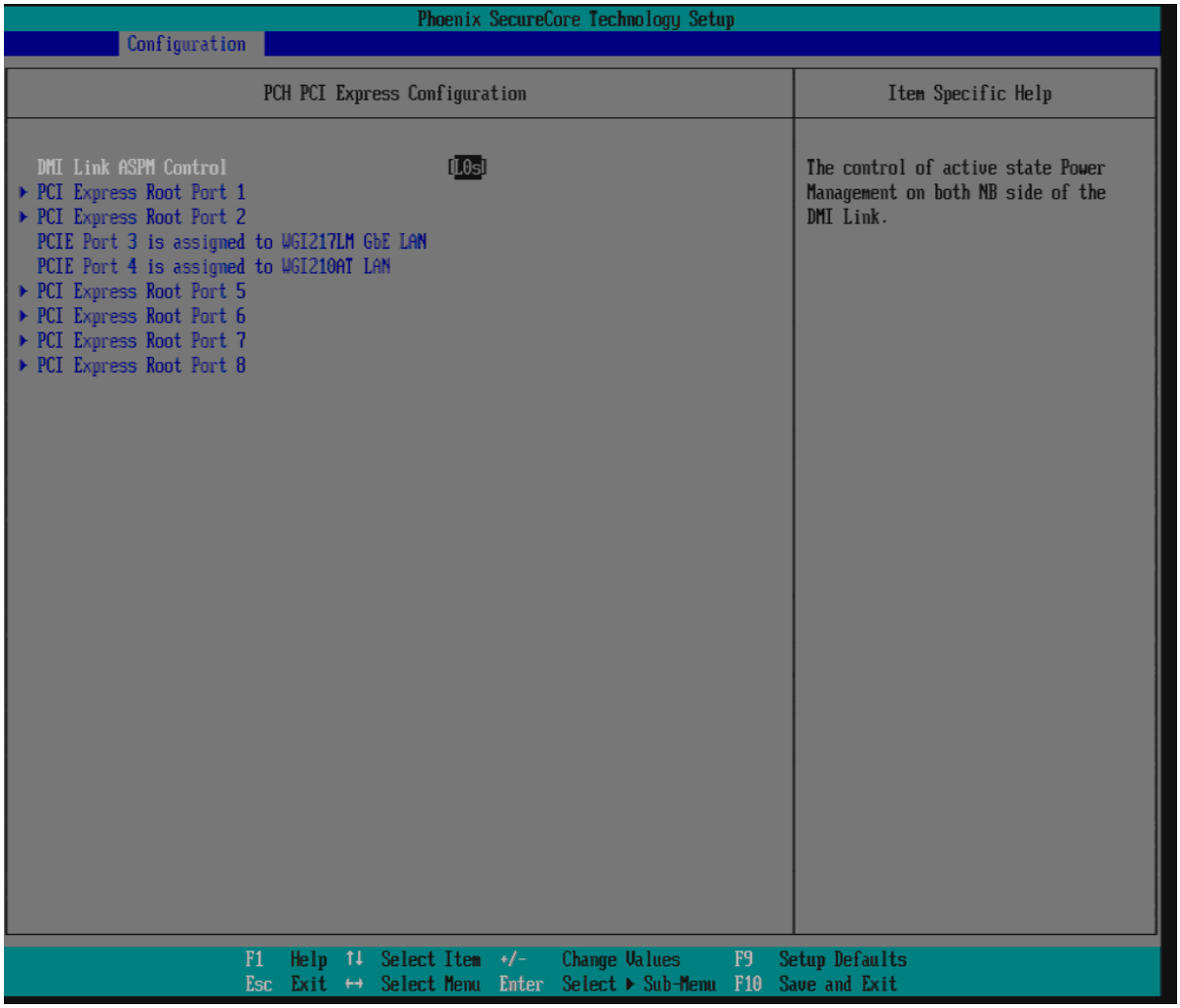
PEG0 – Gen
Configure PEG0 B0:D1:F0 Speed.
The choice: Gen1, Gen2, Gen3.

PEG1 – Gen
Configure PEG0 B0:D1:F1 Speed.
The choice: Gen1, Gen2, Gen3.

PEG2 – Gen
Configure PEG0 B0:D1:F3 Speed.
The choice: Gen1, Gen2, Gen3.

De-emphasis Control
The choice: -6 dB
Choices: Disabled, Enabled.

PCH PCI Express Configuration


Phoenix SecureCore Technology Setup
Configuration
PCH PCI Express Configuration
Item Specific Help
DMI Link ASPM Control [L0s]
PCI Express Root Port 1
PCI Express Root Port 2
PCIE Port 3 is assigned to WGI217LM GbE LAN
PCIE Port 4 is assigned to WGI210AT LAN
PCI Express Root Port 5
PCI Express Root Port 6
PCI Express Root Port 7
PCI Express Root Port 8
The control of active state Power Management on both NB side of the DMI Link.
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit

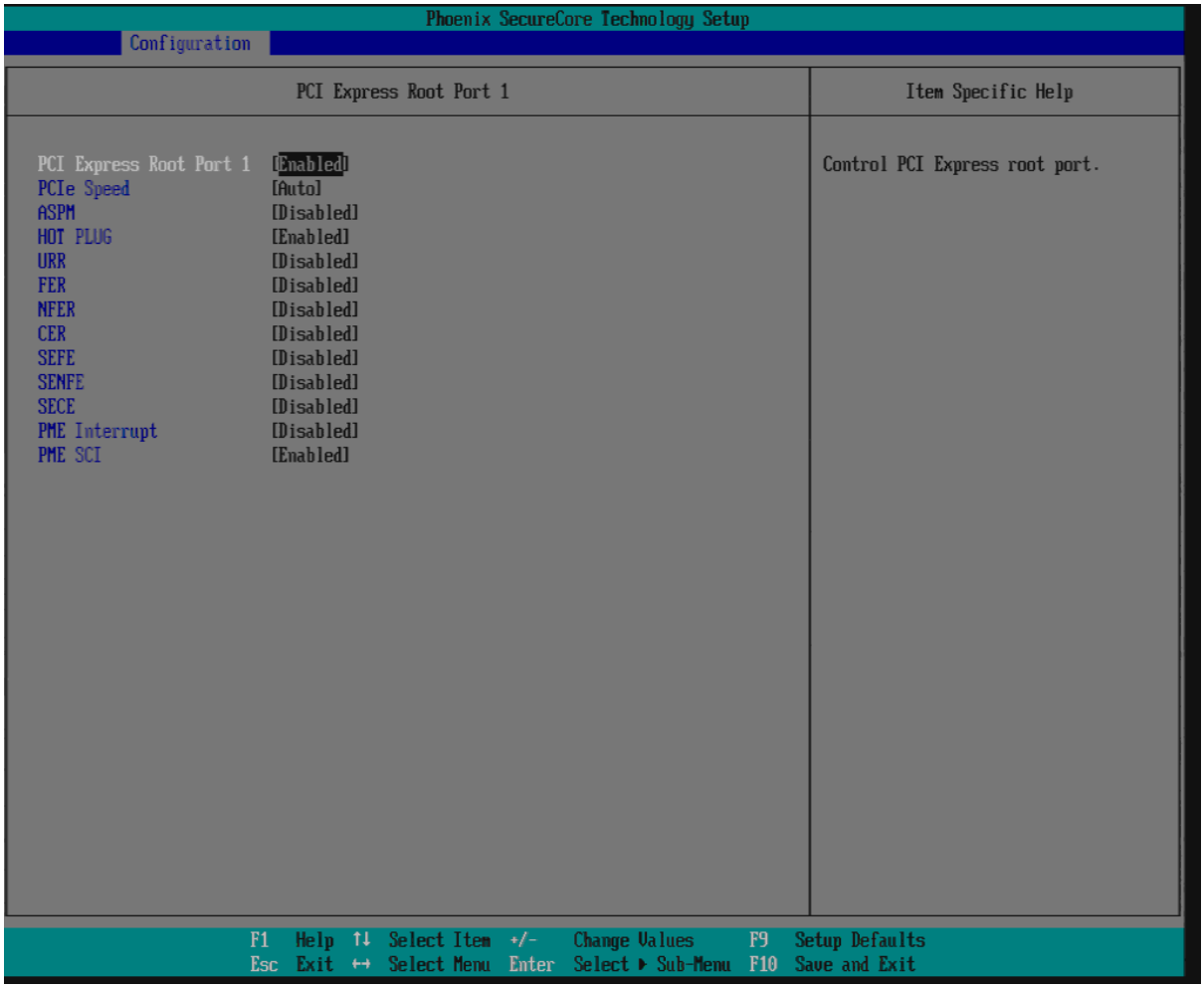
DMI Link ASPM Control

The control of active state Power Management on both NB side of the DMI Link. The choice: Disabled, L0s, L1, L0sL1.

PCIE Port 3 is assigned to WGI217LM GbE LAN

PCIE Port 4 is assigned to WGI210AT GbE LAN

PCI Express Root Port 1/2/5/6/7/8



PCI Express Root Port 1/2/5/6/7/8
Control the PCI Express Root Port.
The choice: Enabled, Disabled.

PCIe Speed
Select PCIe Speed to Gen1 or Gen2.
The choice: Auto, Gen1, Gen2.

ASPM
Control PCIe Active State Power Management settings.
The choice: Disabled, L0S, L1, L0S and L1, Auto.

HOT PLUG
Enable or disable PCI Express Hot Plug.
The choice: Enabled, Disabled.

URR
Enable or disable PCI Express Unsupported Request Reporting.
The choice: Enabled, Disabled.

FER
Enable or disable PCI Express Device Fatal Error Reporting.
The choice: Enabled, Disabled.

NFER
Enable or disable PCI Express Device Non-Fatal Error Reporting.
The choice: Enabled, Disabled.

CER
Enable or disable PCI Express Device Correctable Error Reporting.
The choice: Enabled, Disabled.

SEFE
Enable or disable Root PCI Express System Error on Fatal Error.
The choice: Enabled, Disabled.

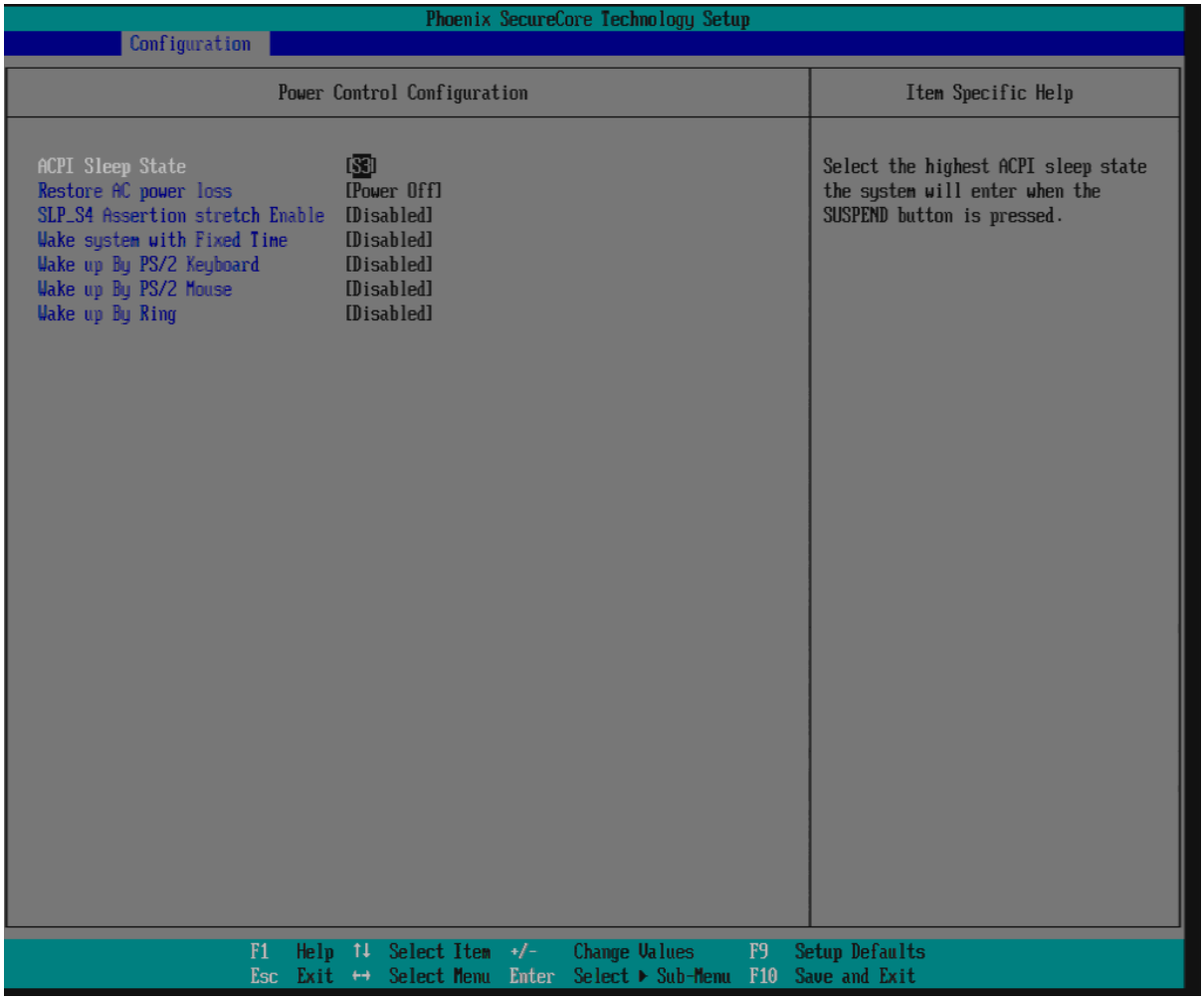
SENFE
Enable or disable Root PCI Express System Error on Non-Fatal Error.
The choice: Enabled, Disabled.

SECE
Enable or disable Root PCI Express System Error on Correctable Error.
The choice: Enabled, Disabled.

PME Interrupt
Enable or disable PCI Express PME Interrupt.
The choice: Enabled, Disabled.

PME SCI
PCI Express PME SCI Enable/Disable.
The choice: Enabled, Disabled.

Power Control Configuration


Phoenix SecureCore Technology Setup
Configuration
Power Control Configuration
Item Specific Help
ACPI Sleep State [S3]
Restore AC power loss [Power Off]
SLP_S4 Assertion stretch Enable [Disabled]
Wake system with Fixed Time [Disabled]
Wake up By PS/2 Keyboard [Disabled]
Wake up By PS/2 Mouse [Disabled]
Wake up By Ring [Disabled]
Select the highest ACPI sleep state the system will enter when the SUSPEND button is pressed.
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit

ACPI Sleep State

Select the highest ACPI sleep state the system will enter when the SUSPEND button is pressed.
The choice: S3.

Restore AC Power Loss

Select AC power state when power is re-applied after a power failure.
The choice: Power Off, Power On, Last State.

SPL_S4 Assertion stretch Enable

The choice: Enabled, Disabled.

Wake system with Fixed Time

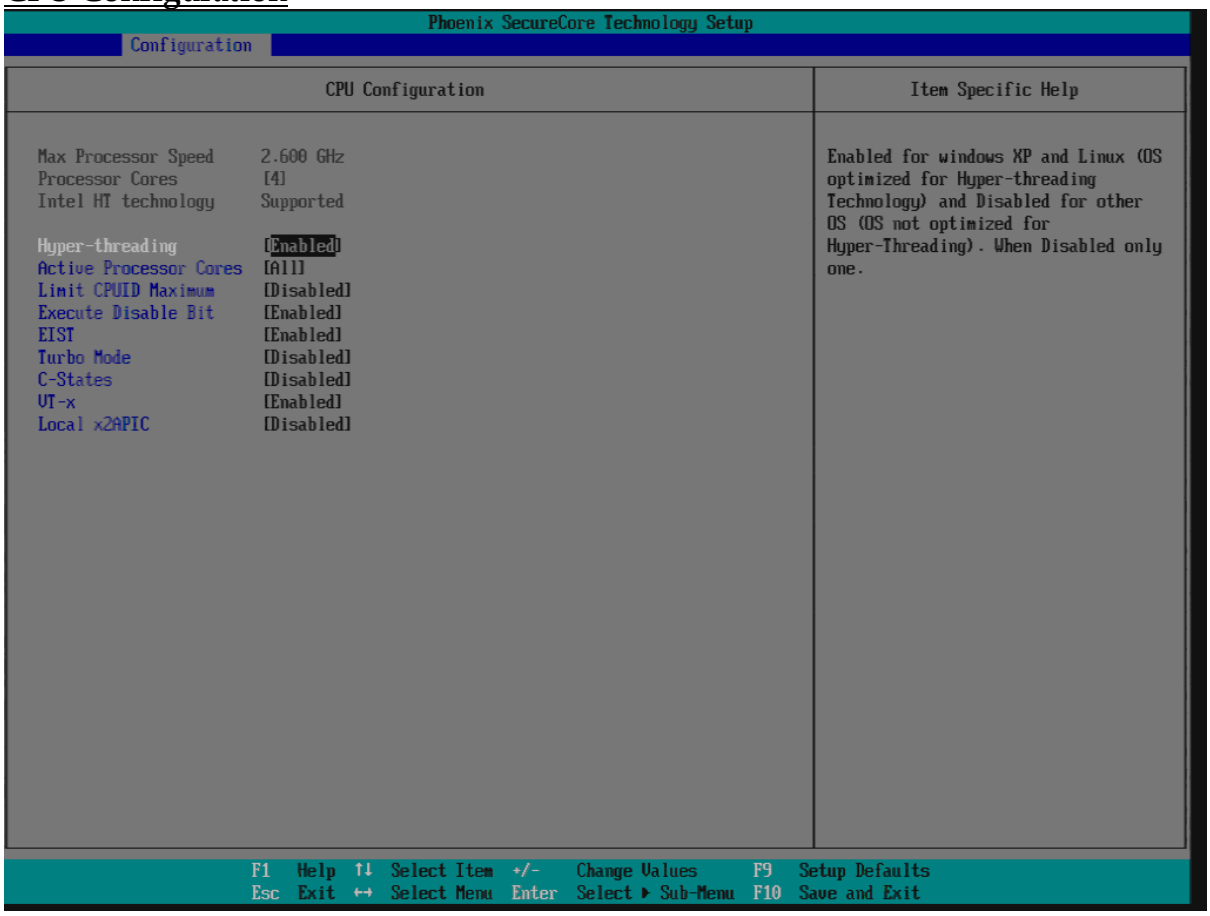
Enable or disable System wake on alarm event. When enabled, System will wake on the hr::min::sec specified.
The choice: Enabled, Disabled.

Wake up By PS/2 Keyboard
Enable or disable integrated PS/2 Keyboard to wake the system.
The choice: Enabled, Disabled.

Wake up By PS/2 Mouse
Enable or disable integrated PS/2 Mouse to wake the system.
The choice: Enabled, Disabled.

Wake up By Ring
Enable or disable Ring to wake the system.
The choice: Enabled, Disabled.

CPU Configuration


Phoenix SecureCore Technology Setup
Configuration
CPU Configuration
Item Specific Help
Max Processor Speed 2.600 GHz
Processor Cores [4]
Intel HT technology Supported
Hyper-threading [Enabled]
Active Processor Cores [All]
Limit CPUID Maximum [Disabled]
Execute Disable Bit [Enabled]
EIST [Enabled]
Turbo Mode [Disabled]
C-States [Disabled]
VT-x [Enabled]
Local x2APIC [Disabled]
Enabled for windows XP and Linux (OS optimized for Hyper-threading Technology) and Disabled for other OS (OS not optimized for Hyper-Threading). When Disabled only one.
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit

Hyper-threading
Enabled for Windows XP and Linux (OS optimized for Hyper-Threading Technology) and Disabled for other OS (OS not optimized for Hyper- Threading Technology). When Disabled only one.
The choice: Enabled, Disabled.

Active Processor Cores
Number of cores to enable in each processor package.
The choice: All, 1, 2, 3.

Limit CPUID Maximum
Disabled for Windows XP.
The choice: Enabled, Disabled.

Execute Disable Bit
Enabled Execute Disabled functionality. Also known as Data Execution Prevention (DEP).
The choice: Enabled, Disabled.

EIST
Enable/Disable Intel SpeedStep

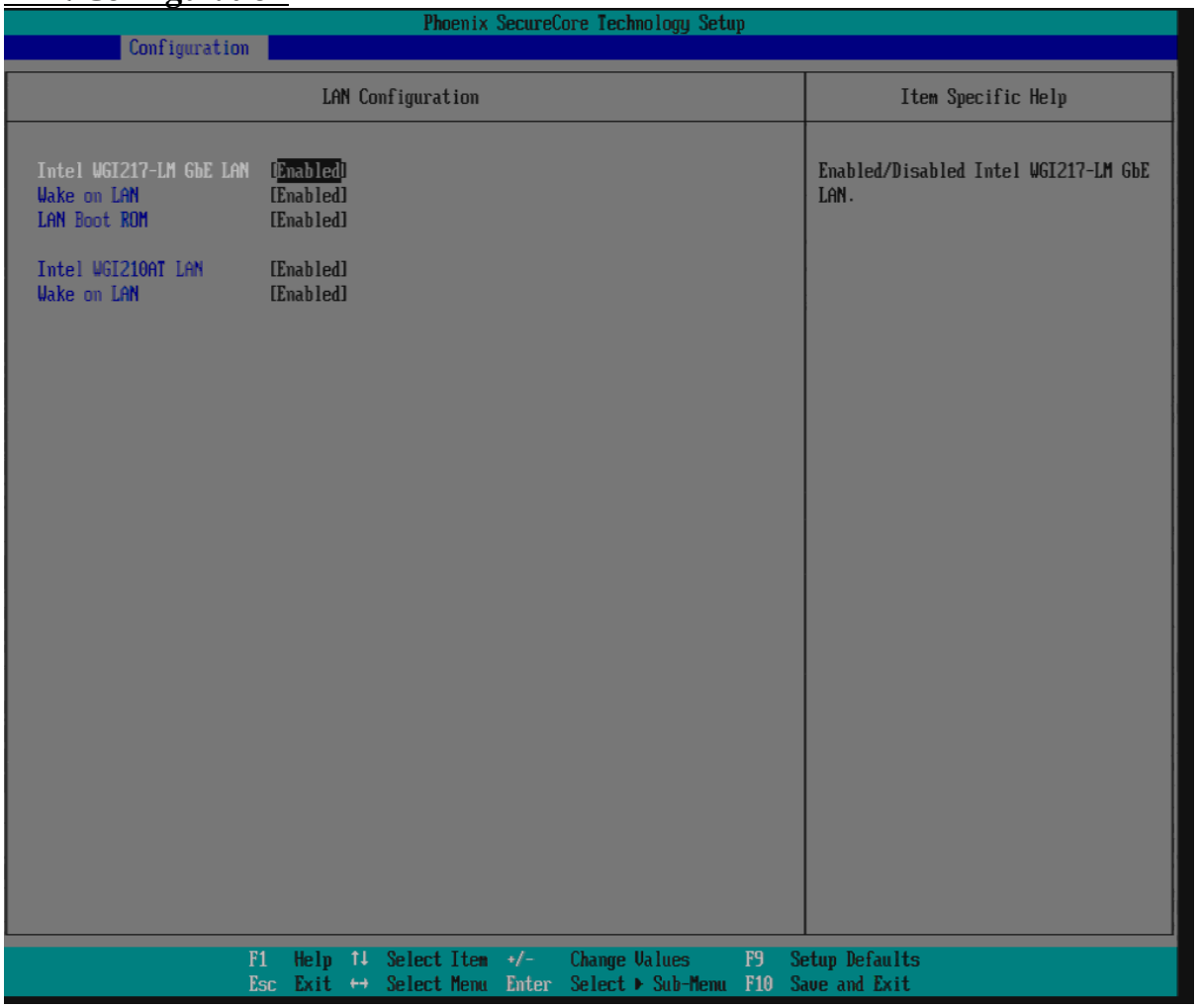
Turbo Mode
Enable processor Turbo Mode. EMTTM must also be enabled.
The choice: Enabled, Disabled.

C-States
Enable processor idle power saving states (C-States).
The choice: Enabled, Disabled.

VT-x
When enabled, a VWM can utilize the additional hardware capabilities provided by Vanderpool Technology
The choice: Enabled, Disabled.

Local x2APIC
Enable Local x2APIC. Some 0Ses do not support this.
The choice: Enabled, Disabled.

LAN Configuration


Phoenix SecureCore Technology Setup
Configuration
LAN Configuration
Item Specific Help
Intel WGI217-LM GbE LAN [Enabled]
Wake on LAN [Enabled]
LAN Boot ROM [Enabled]
Intel WGI210AT LAN [Enabled]
Wake on LAN [Enabled]
Enabled/Disabled Intel WGI217-LM GbE LAN.
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit

Intel WGI217-LM GbE LAN

Enabled/Disabled Intel WGI217-LM GbE LAN.
The choice: Enabled, Disabled.

Wake on LAN

Enable/Disable wake on LAN Function.
The choice: Enabled, Disabled.

LAN Boot ROM

Enable or disable integrated LAN Boot ROM(PXE) function.
The choice: Enabled, Disabled.

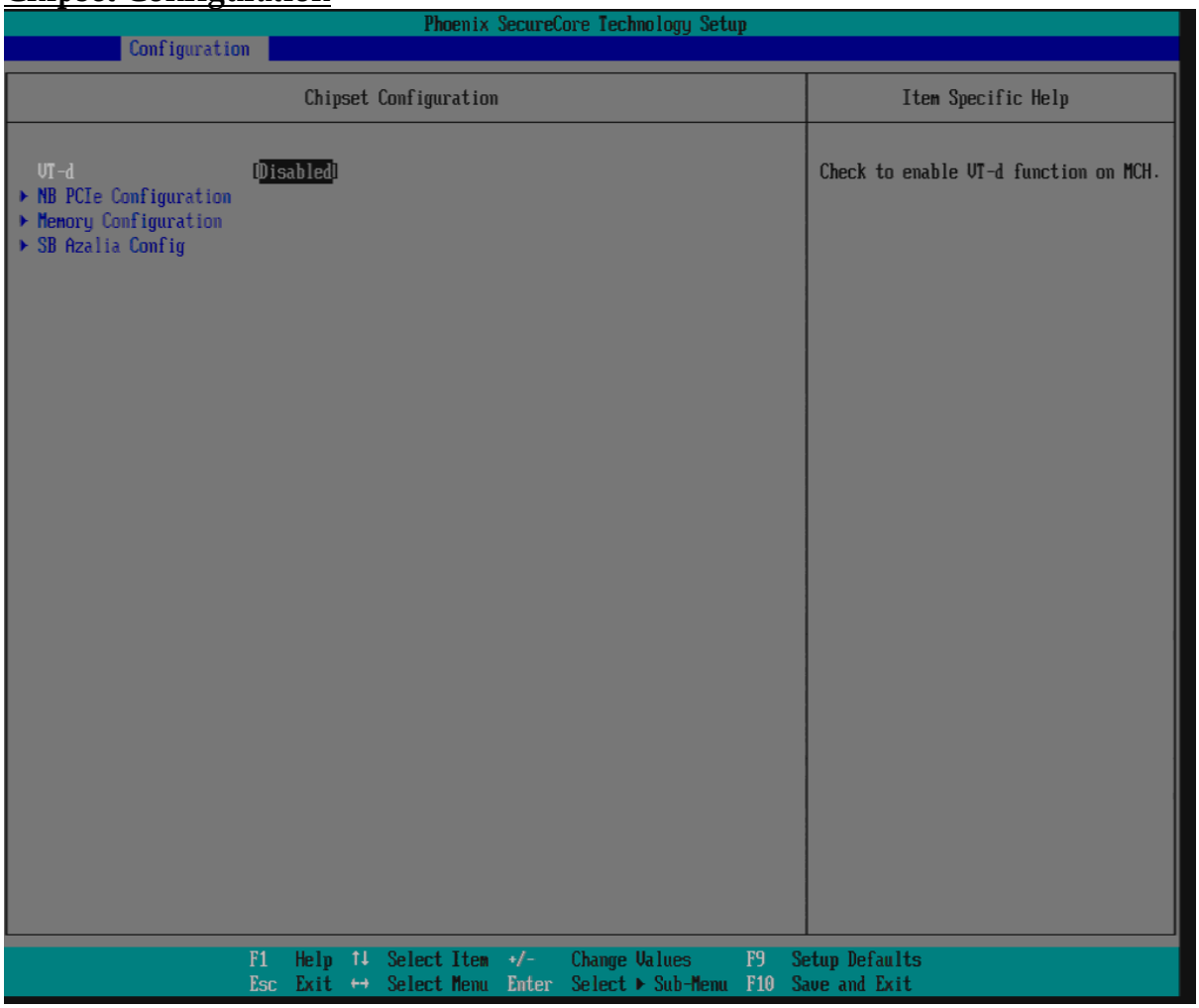
Intel WGI210AT LAN

Enabled/Disabled Intel WGI210AT LAN.
The choice: Enabled, Disabled.

Wake on LAN

Enable/Disable wake on LAN Function.
The choice: Enabled, Disabled.

Chipset Configuration

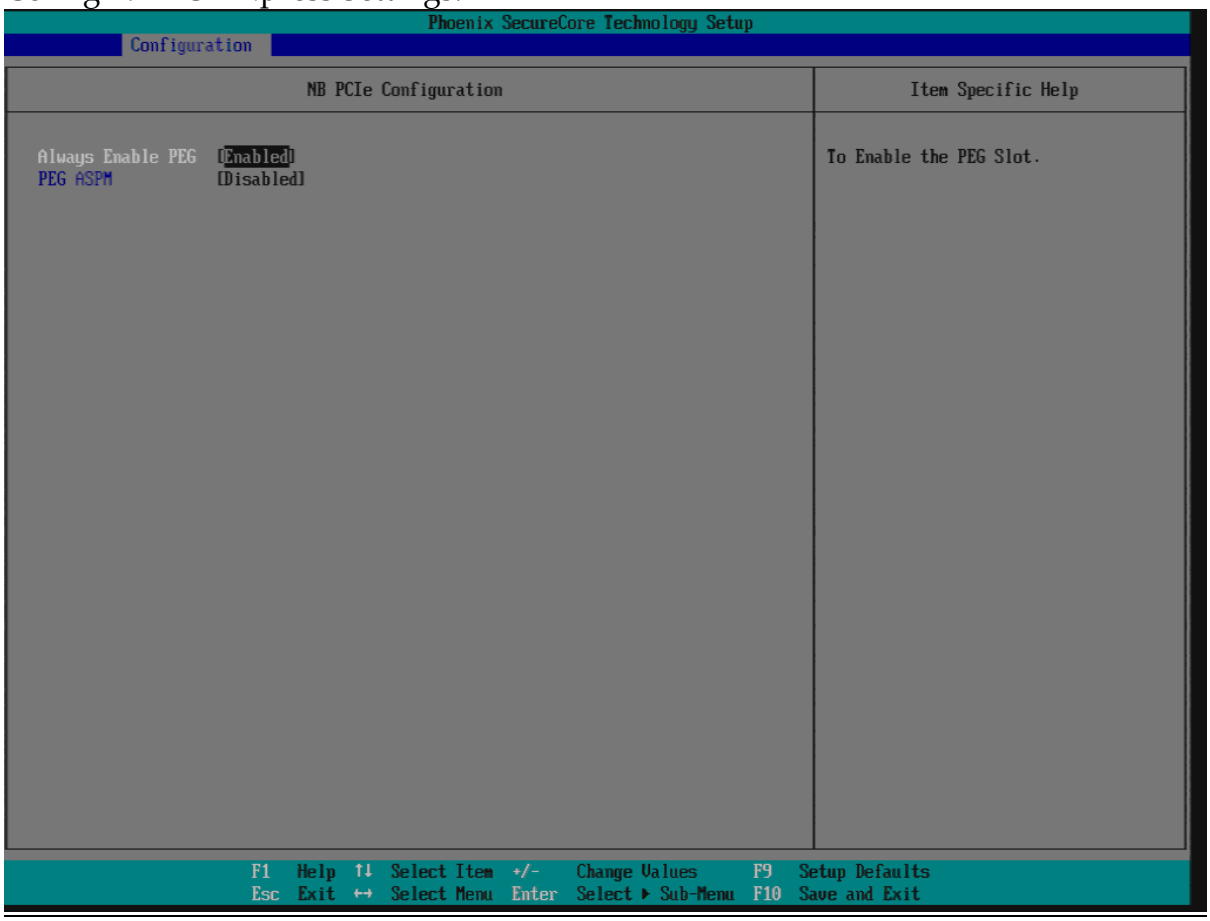

Phoenix SecureCore Technology Setup
Configuration
Chipset Configuration
Item Specific Help
VT-d [Disabled]
NB PCIe Configuration
Memory Configuration
SB Azalia Config
Check to enable VT-d function on MCH.
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit

VT-d

Check to enable VT-d function on MCH.
The choice: Disabled, Enabled.

NB PCIe Configuration

Config NB PCI Express Settings.


Phoenix SecureCore Technology Setup
Configuration
NB PCIe Configuration
Item Specific Help
Always Enable PEG [Enabled]
PEG ASPM [Disabled]
To Enable the PEG Slot.
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit

Always Enable PEG

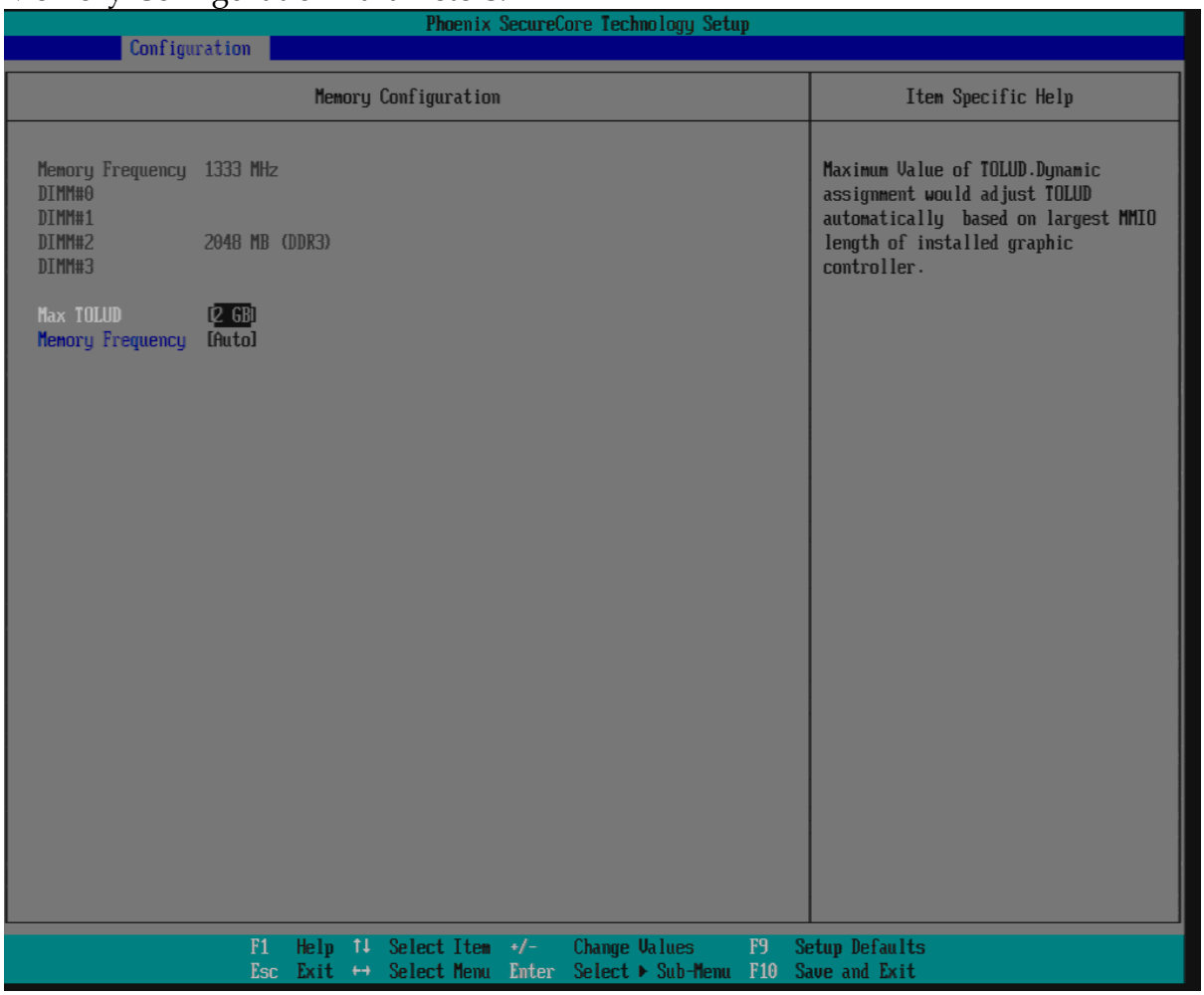
To Enable the PEG Slot.
The choice: Disabled, Enabled.

PEG ASPM

Control ASPM Support for the PEG Device. This has mp effect if PEF is not the current active device.
The choice: Disabled, ASPM L0s, ASPM L1, ASPM L0sL1.

Memory Configuration

Memory Configuration Parameters.


Phoenix SecureCore Technology Setup
Configuration
Memory Configuration
Item Specific Help
Memory Frequency 1333 MHz
DIMM#0
DIMM#1
DIMM#2 2048 MB (DDR3)
DIMM#3
Max TOLUD [2 GB]
Memory Frequency [Auto]
Maximum Value of TOLUD.Dynamic assignment would adjust TOLUD automatically based on largest MMIO length of installed graphic controller.
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit

Max TOLUD

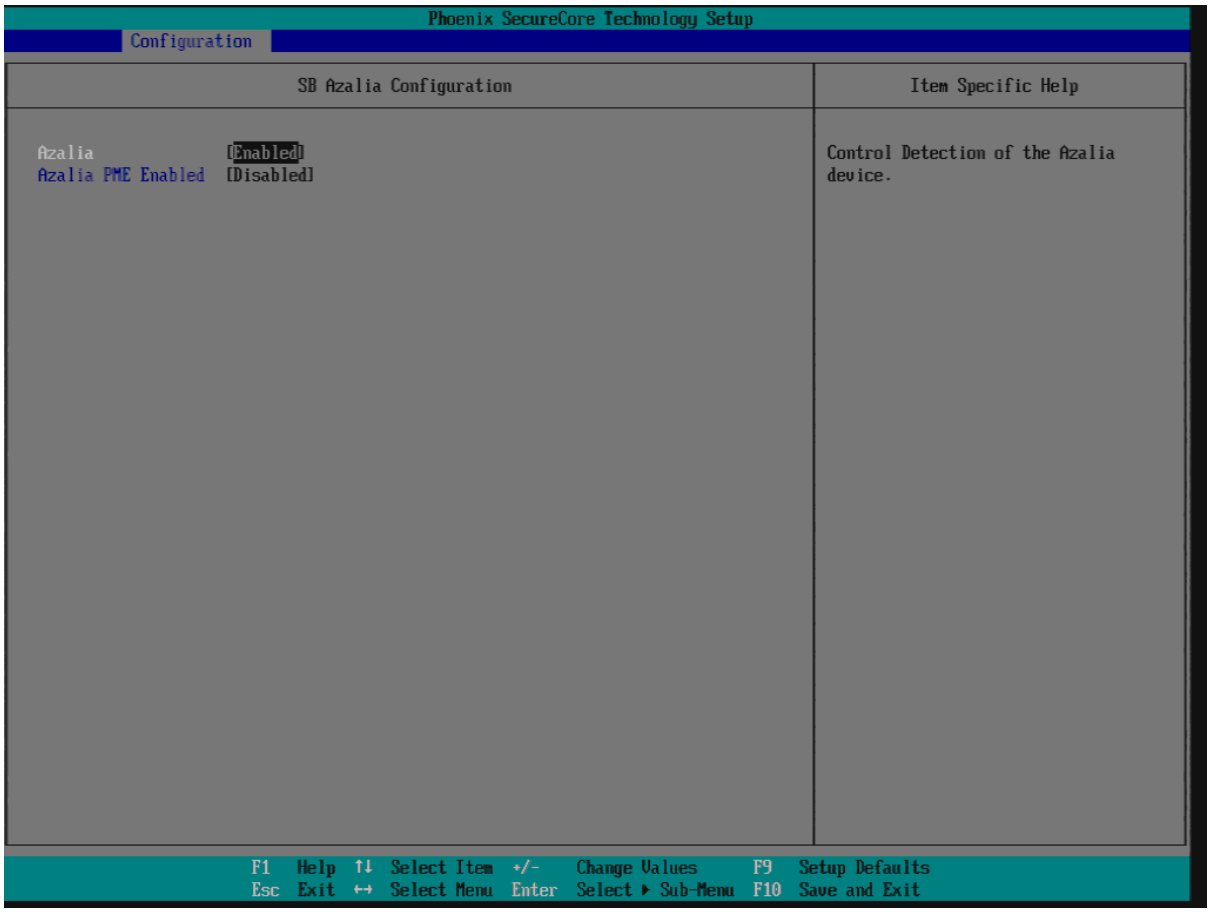
Maximum Value of TOLUD. Dynamic assignment would adjust TOLUD automatically based on larges MMIO length of installed graphic controller.
The choice: Dynamic, 1GB, 1.25 GB, 1.5 GB, 1.75GB, 2GB, 2.25GB, 2.5GB, 2.75GB, 3GB, 3.25GB.

Memory Frequency

Maximum Memory Frequency Selections in Mhz.
The choice: Auto, 1067, 1333, 1600, 1867, 2133.

SB Azalia Configuration

Control Detection of the Azalia device.


Phoenix SecureCore Technology Setup
Configuration
SB Azalia Configuration
Item Specific Help
Azalia [Enabled]
Azalia PME Enabled [Disabled]
Control Detection of the Azalia device.
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit

Azalia

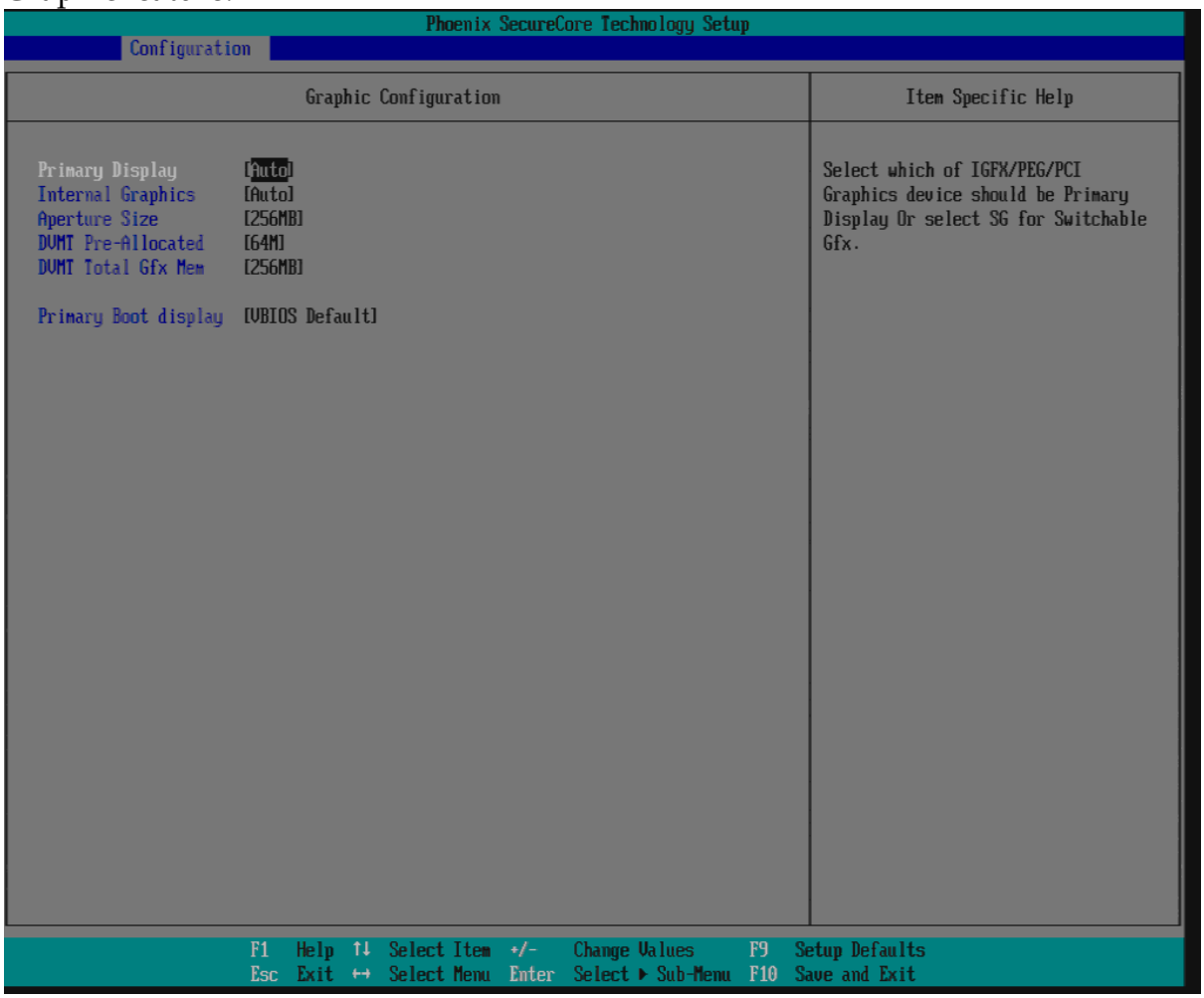
Control Detection of the Azalia device.
The choice: Disabled, Enabled.

Azalia PME Enabled

Enable/Disable PME for Azalia.
The choice: Disabled, Enabled.

Graphic Configuration

Configure integrated Graphic like Boot display , video memory and external Graphic feature.


Phoenix SecureCore Technology Setup
Configuration
Graphic Configuration
Item Specific Help
Primary Display [Auto]
Internal Graphics [Auto]
Aperture Size [256MB]
DVMT Pre-Allocated [64M]
DVMT Total Gfx Mem [256MB]
Primary Boot display [VBIOS Default]
Select which of IGFX/PEG/PCI Graphics device should be Primary Display Or select SG for Switchable Gfx.
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit

Primary Display

Select which of IGFX/PEG/PCI Graphics device should be Primary Display Or select SG for Switchable Gfx.
Choices: Auto, IGFX, PEG, PCI.

Internal Graphics

Keep IGD Enabled based on the setup options
Choices: Auto, Disabled, Enabled.

Aperture Size

Select the Aperture Size.
Choices: 128MB, 256MB, 512MB.

DVMT Pre-Allocated

Select DVMT 5.0 Pre-Allocated (Fixed) Graphics Memory size used by the internal Graphic Device.
Choices: 0M, 32M, 64M, 96M, 128M, 160M, 192M, 224M, 256M, 288M, 320M, 352M, 384M, 416M, 448M, 480M, 512M.

DVMT Total Gfx Mem

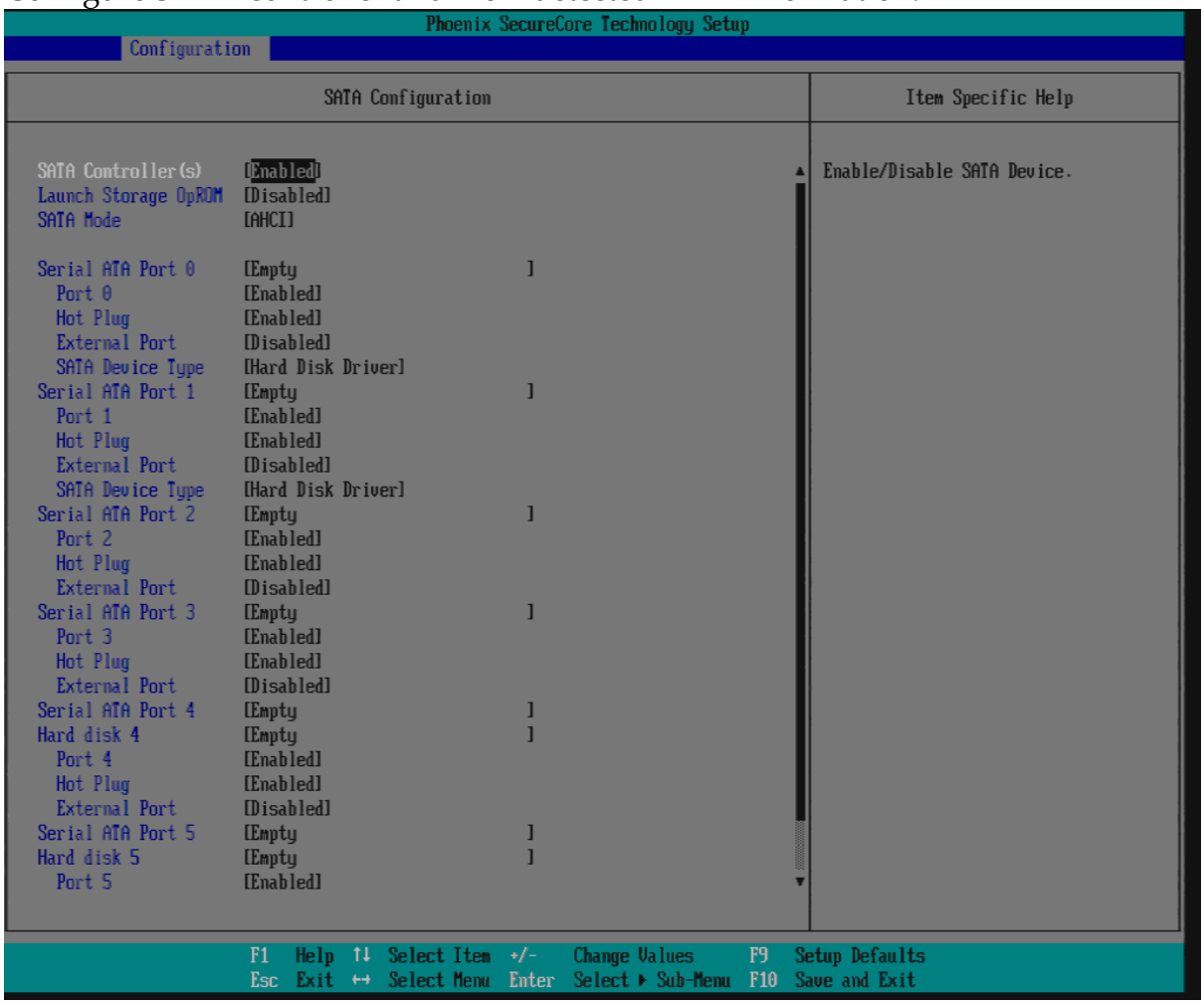
Select DVMT 5.0 Total Graphic Memory size used by the internal Graphic Device.
Choices: 128MB, 256MB, MAX.

Primary Boot display

Choices: VBIOS Default, CRT, DP>HDMI, HDMI.

SATA Configuration

Configure SATA controller and view detected HDD information.


Phoenix SecureCore Technology Setup
Configuration
SATA Configuration
Item Specific Help
SATA Controller(s) [Enabled]
Enable/Disable SATA Device.
Launch Storage OpROM [Disabled]
SATA Mode [AHCI]
Serial ATA Port 0 [Empty]
Port 0 [Enabled]
Hot Plug [Enabled]
External Port [Disabled]
SATA Device Type [Hard Disk Driver]
Serial ATA Port 1 [Empty]
Port 1 [Enabled]
Hot Plug [Enabled]
External Port [Disabled]
SATA Device Type [Hard Disk Driver]
Serial ATA Port 2 [Empty]
Port 2 [Enabled]
Hot Plug [Enabled]
External Port [Disabled]
Serial ATA Port 3 [Empty]
Port 3 [Enabled]
Hot Plug [Enabled]
External Port [Disabled]
Serial ATA Port 4 [Empty]
Hard disk 4 [Empty]
Port 4 [Enabled]
Hot Plug [Enabled]
External Port [Disabled]
Serial ATA Port 5 [Empty]
Hard disk 5 [Empty]
Port 5 [Enabled]
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit

SATA Controller (s)

Determines how SATA controller (s) operate.
Choices: Disabled, Enabled.

Launch Storage OpROM

Enable or Disable Boot Option for Legacy Mass Storage Devices with Option ROM.
Choices: Enabled, Disabled.

SATA Mode
Determines how SATA controller (s) operate.
Choices: IDE, AHCI, RAID.

Serial ATA Port 0-5
Display the identity of the device attached.

Port 0-5
Enable or Disable SATA Port 0-5.
Choices: Enabled, Disabled.

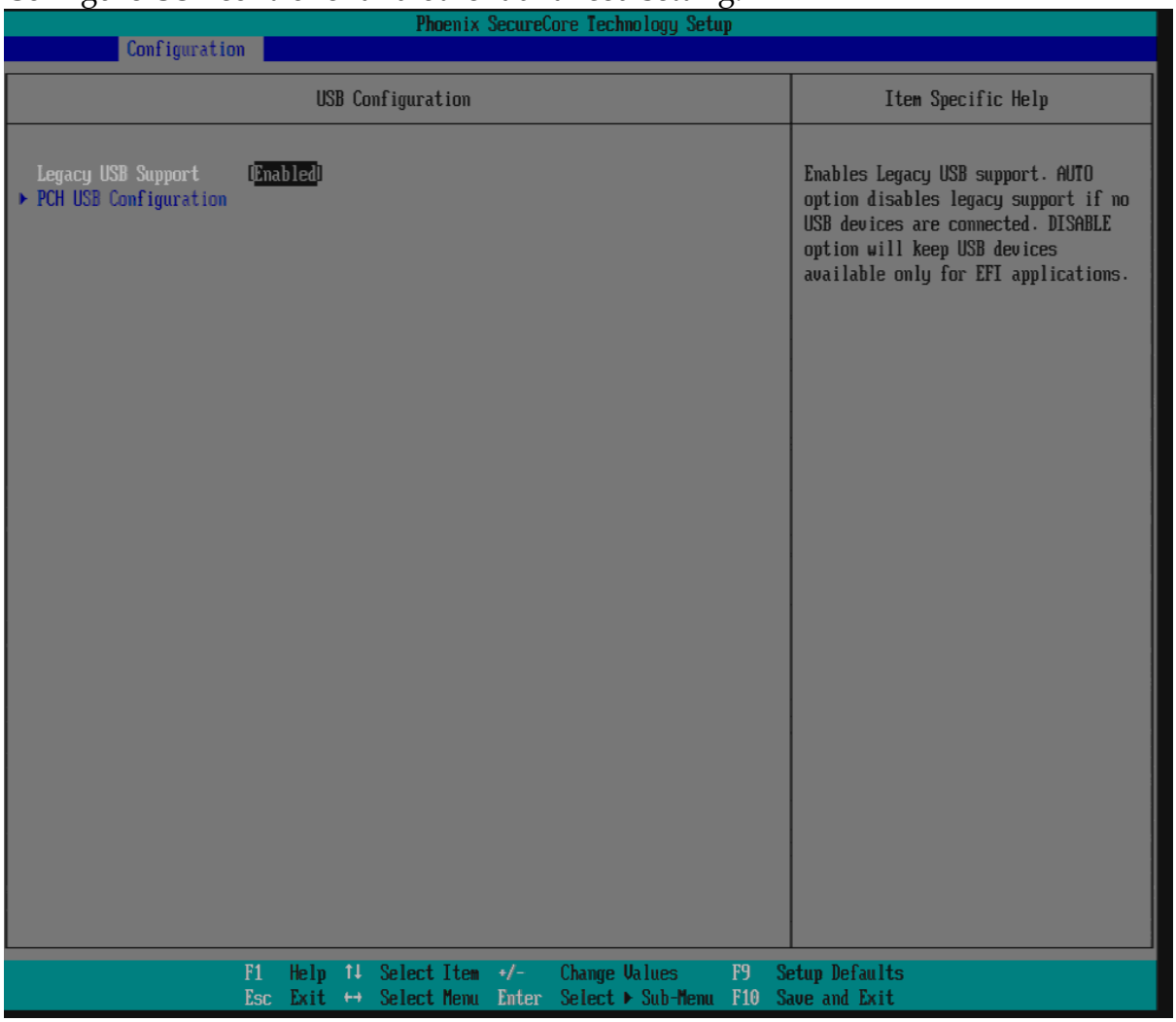
Hot Plug
Designates this port as Hot Pluggable.
Choices: Enabled, Disabled.

External Port
External SATA Support.
Choices: Enabled, Disabled.

SATA Device Type
Identify the SATA port is connected to Solid State Drive or Hard Disk Drive.
Choices: Hard Disk Driver, Solid State Driver.

USB Configuration

Configure USB controller and other advanced setting.


Phoenix SecureCore Technology Setup
Configuration
USB Configuration
Item Specific Help
Legacy USB Support [Enabled]
PCH USB Configuration
Enables Legacy USB support. AUTO option disables legacy support if no USB devices are connected. DISABLE option will keep USB devices available only for EFI applications.
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit

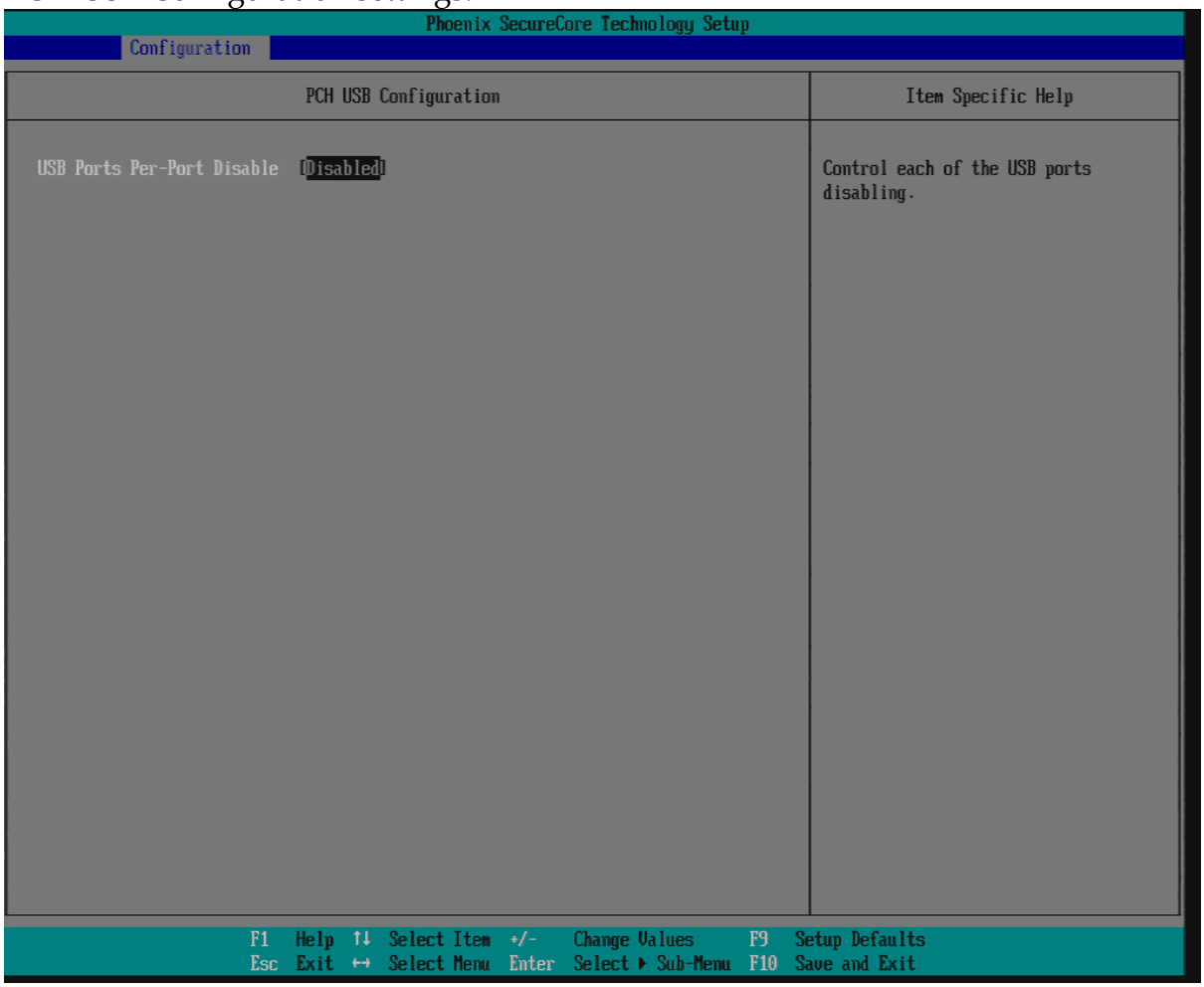
Legacy USB Support

Enables Legacy USB support. AUTO option disables legacy support if no USB devices are connected. DISABLE option will keep USB devices available only for EFI applications.

Choices: Enabled, Disabled.

PCH USB Configuration

PCH USB Configuration settings.

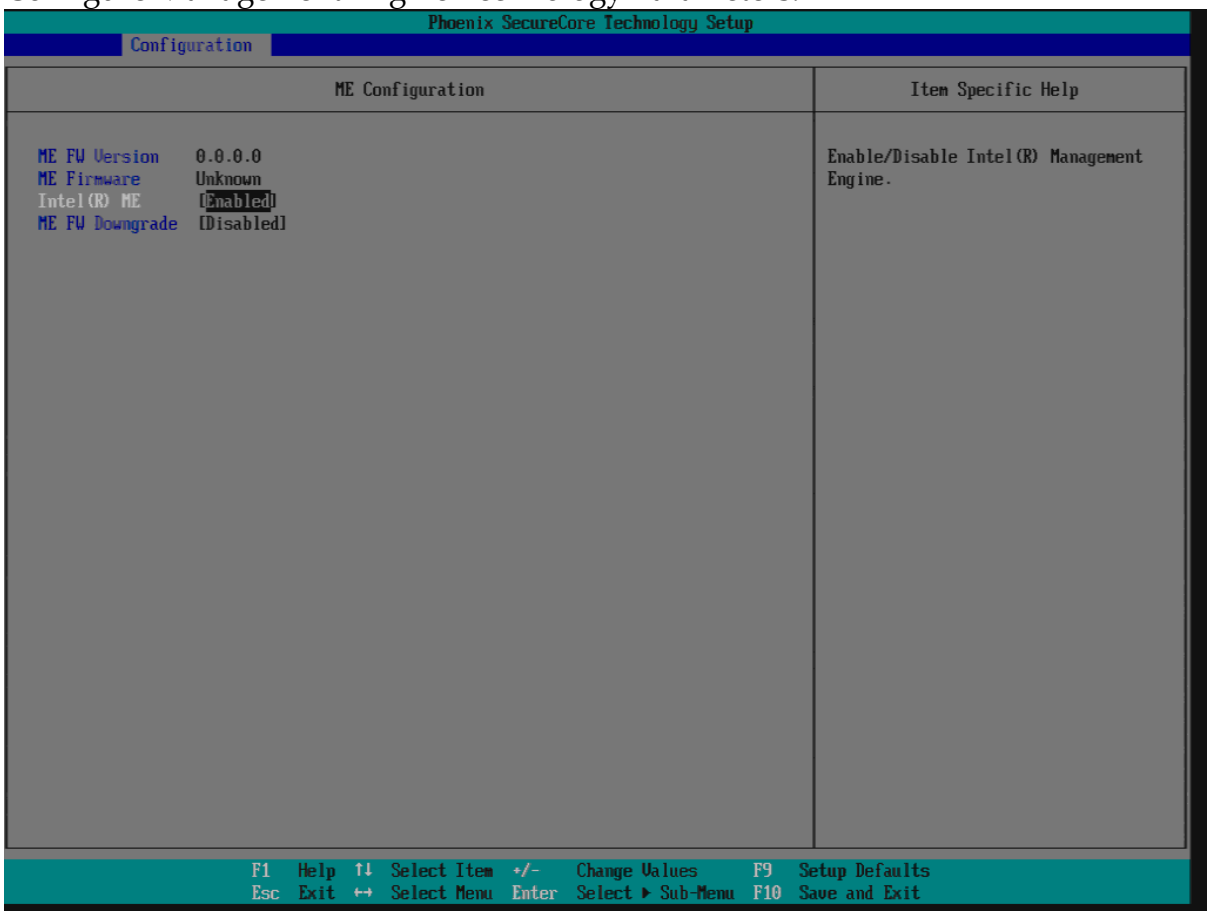

Phoenix SecureCore Technology Setup
Configuration
PCH USB Configuration
Item Specific Help
USB Ports Per-Port Disable [Disabled]
Control each of the USB ports disabling.
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit

USB Ports Per-Port Disable

Control each of the USB ports disabling.
Choices: Enabled, Disabled.

ME Configuration

Configure Management Engine Technology Parameters.


Phoenix SecureCore Technology Setup
Configuration
ME Configuration
Item Specific Help
ME FW Version 0.0.0.0
ME Firmware Unknown
Intel(R) ME [Enabled]
ME FW Downgrade [Disabled]
Enable/Disable Intel(R) Management Engine.
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit

Intel (R) ME

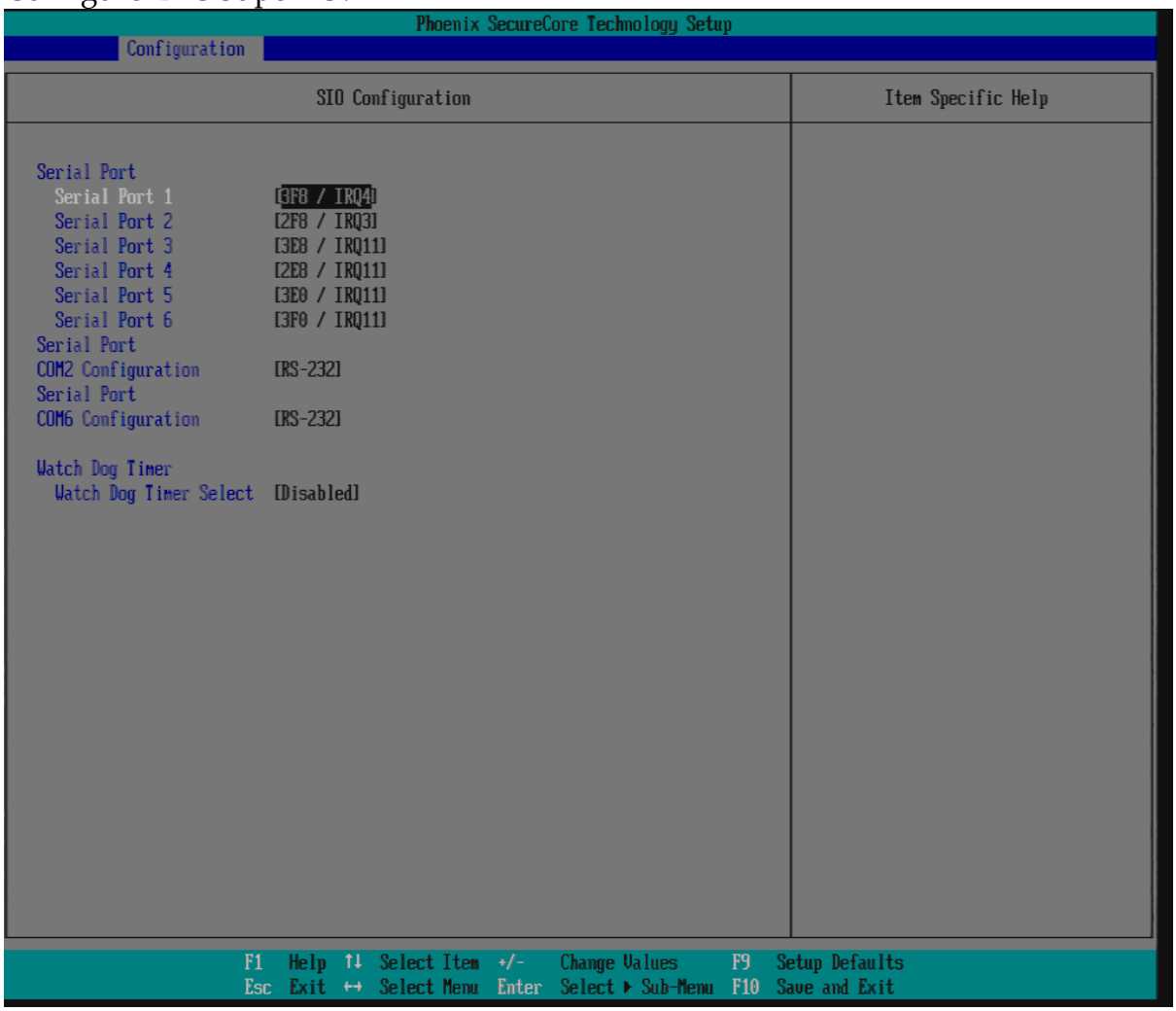
Enable/Disable Intel (R) Management Engine.
Choices: Enabled, Disabled.

ME FW Downgrade

Enable/Disable ME FW Downgrade function.
Choices: Enabled, Disabled.

Super IO Configuration

Configure LPC Super IO.


Phoenix SecureCore Technology Setup
Configuration
SIO Configuration
Item Specific Help
Serial Port
Serial Port 1 [3F8 / IRQ4]
Serial Port 2 [2F8 / IRQ3]
Serial Port 3 [3E8 / IRQ11]
Serial Port 4 [2E8 / IRQ11]
Serial Port 5 [3E0 / IRQ11]
Serial Port 6 [3F0 / IRQ11]
Serial Port
COM2 Configuration [RS-232]
Serial Port
COM6 Configuration [RS-232]
Watch Dog Timer
Watch Dog Timer Select [Disabled]
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit

Serial Port 1

Choices: Disabled, 3F8/IRQ4, 2F8/IRQ3.

Serial Port 2

Choices: Disabled, 3F8/IRQ4, 2F8/IRQ3.

Serial Port 3

Choices: Disabled, 3E8/IRQ11, 2E8/IRQ11, 3E0/IRQ11, 2E0/IRQ11.

Serial Port 4

Choices: Disabled, 3E8/IRQ11, 2E8/IRQ11, 3E0/IRQ11, 2E0/IRQ11.

Serial Port 5

Choices: Disabled, 3E8/IRQ11, 2E8/IRQ11, 3E0/IRQ11, 2E0/IRQ11.

Serial Port 6

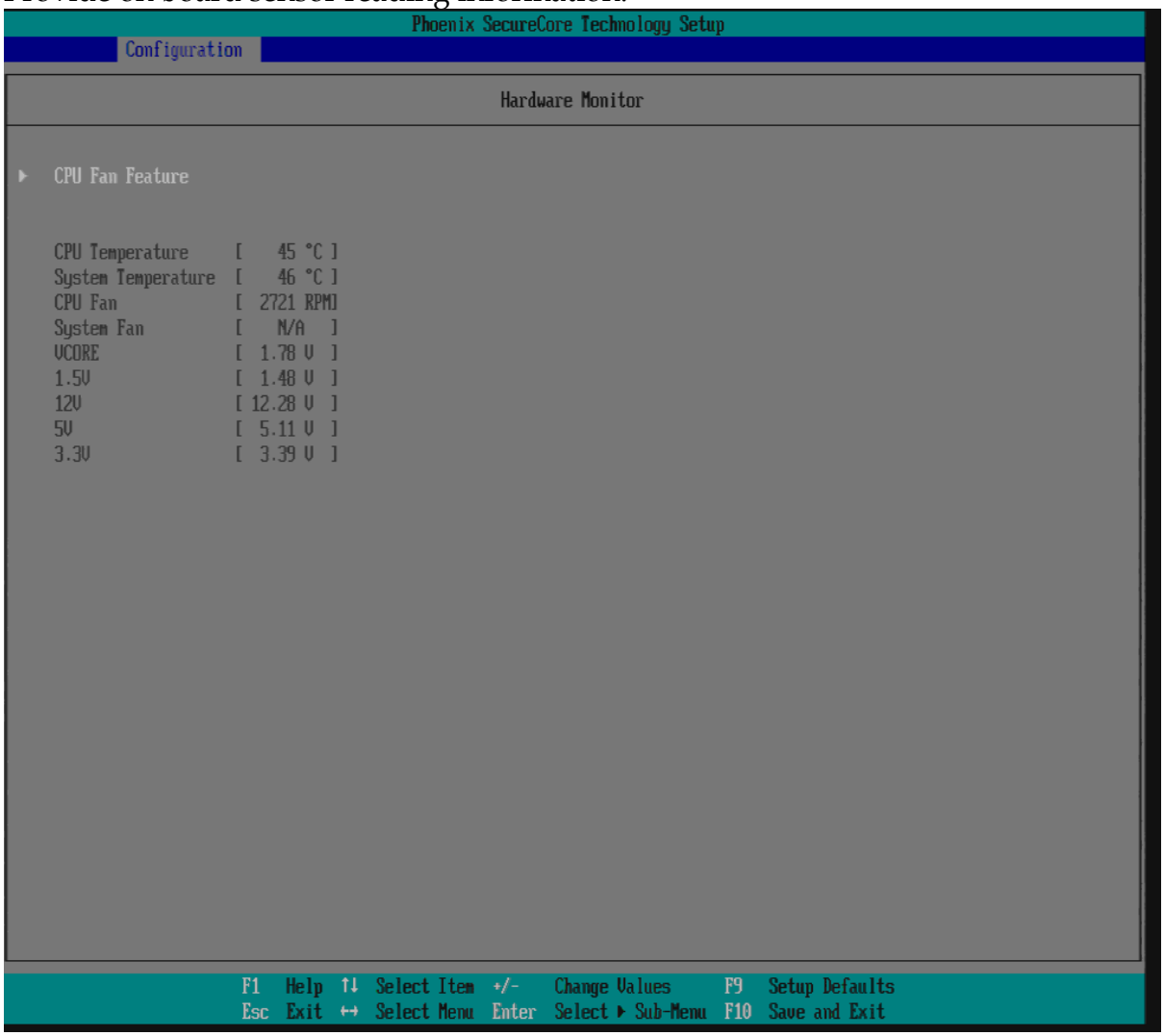
Choices: Disabled, 3E8/IRQ11, 2E8/IRQ11, 3E0/IRQ11, 2E0/IRQ11.

COM2 Configuration
Choices: RS-232, RS-422, RS-485.

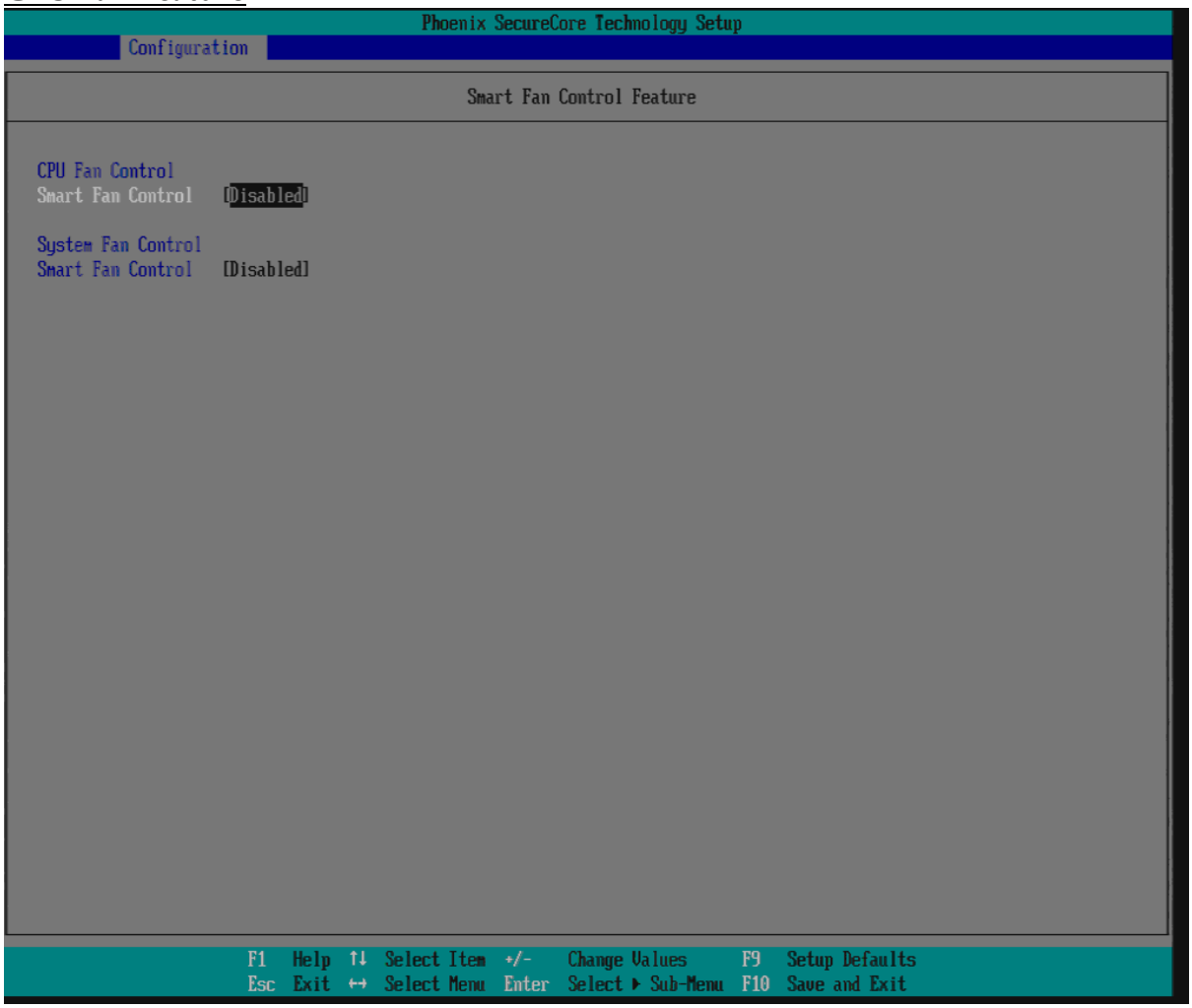
COM6 Configuration
Choices: RS-232, RS-422, RS-485.

Watch Dog Timer Select
Choices: Disabled, 30 secs, 1 min, 2 mins, 3 mins.

Hardware Monitor
Provide on board sensor reading information.


Phoenix SecureCore Technology Setup
Configuration
Hardware Monitor
CPU Fan Feature
CPU Temperature [45 °C]
System Temperature [46 °C]
CPU Fan [2721 RPM]
System Fan [N/A]
VCORE [1.78 V]
1.5V [1.48 V]
12V [12.28 V]
5V [5.11 V]
3.3V [3.39 V]
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit

CPU Fan Feature

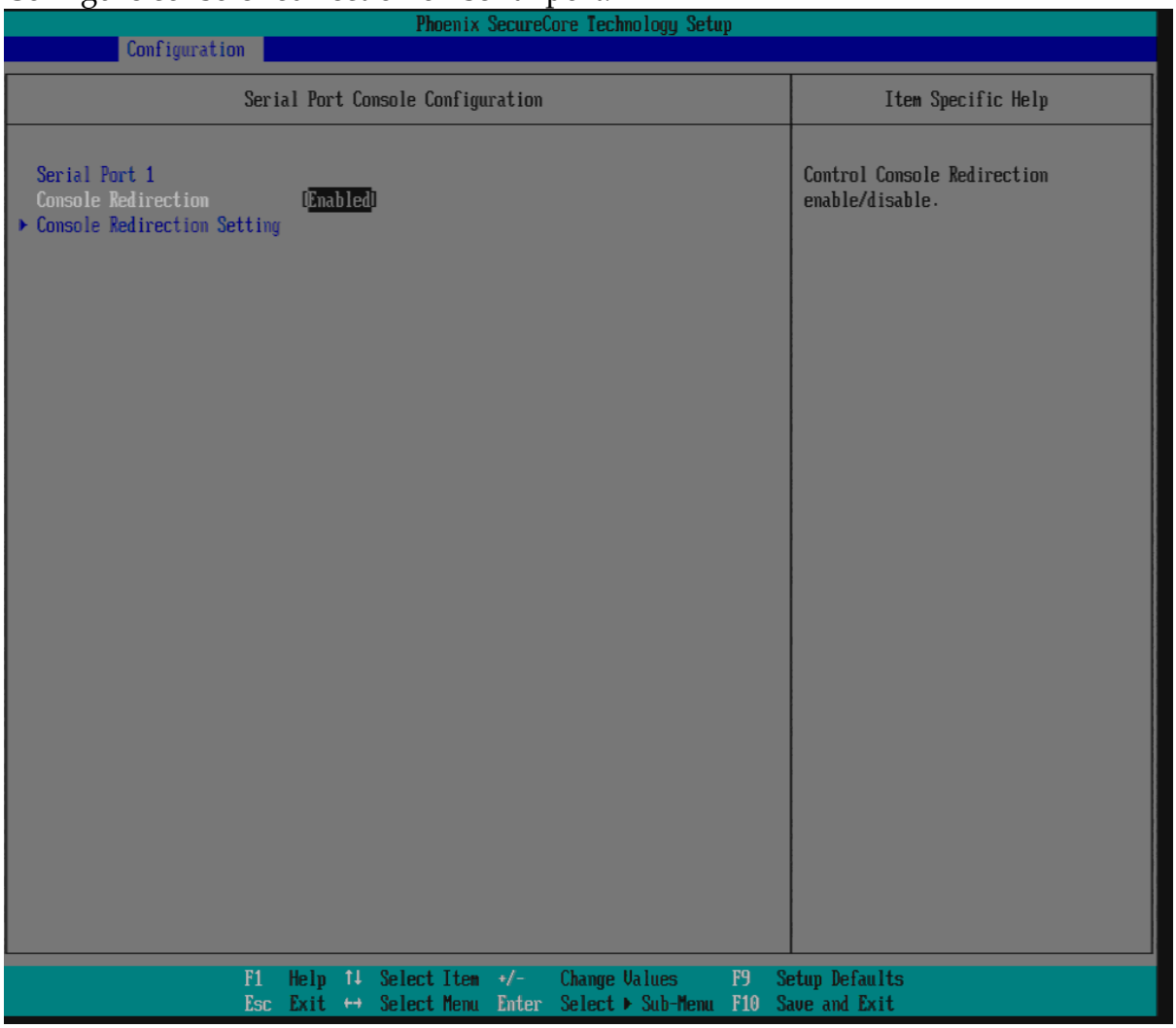

Phoenix SecureCore Technology Setup
Configuration
Smart Fan Control Feature
CPU Fan Control
Smart Fan Control [Disabled]
System Fan Control
Smart Fan Control [Disabled]
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit

Smart Fan Control
Choices: Enabled, Disabled.

Smart Fan Control
Choices: Enabled, Disabled

Serial Port Console Configuration

Configure console redirection on serial port.

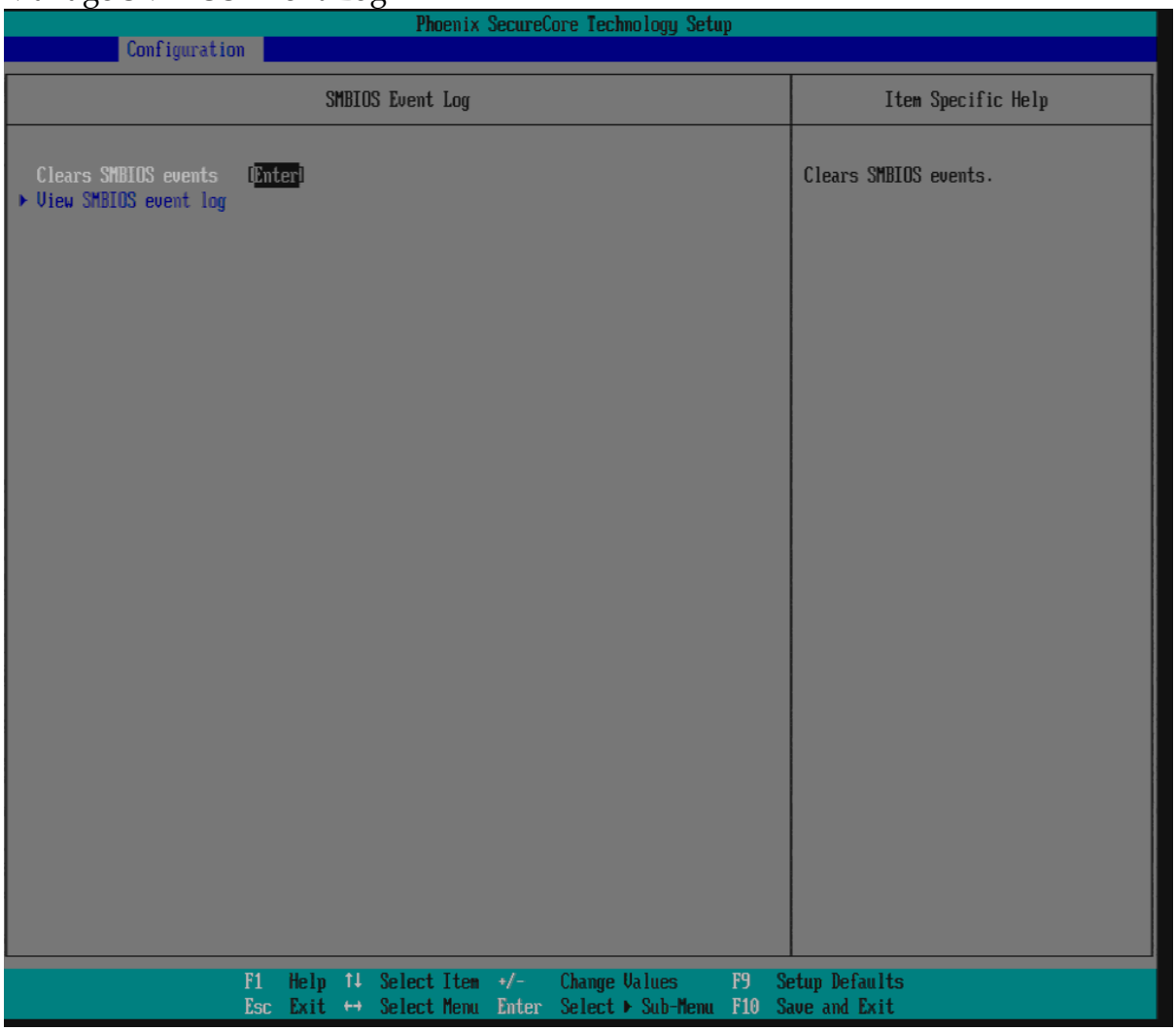

Phoenix SecureCore Technology Setup
Configuration
Serial Port Console Configuration
Item Specific Help
Serial Port 1
Console Redirection [Enabled]
Console Redirection Setting
Control Console Redirection enable/disable.
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit

Console Redirection

Control Console Redirection enable/disable.
Choices: Enabled, Disabled

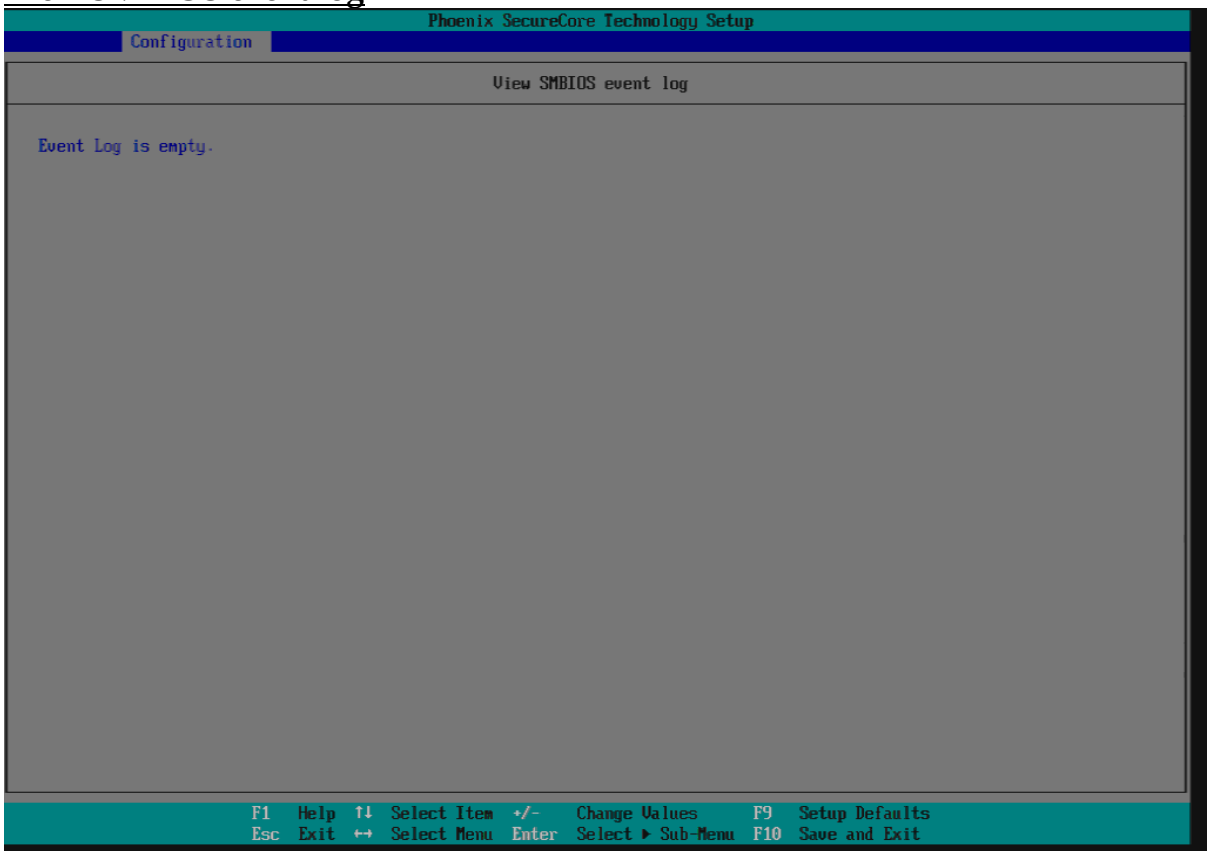
SMBIOS Event Log

Manage SMBIOS Event Log


Phoenix SecureCore Technology Setup
Configuration
SMBIOS Event Log
Item Specific Help
Clears SMBIOS events [Enter]
View SMBIOS event log
Clears SMBIOS events.
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit

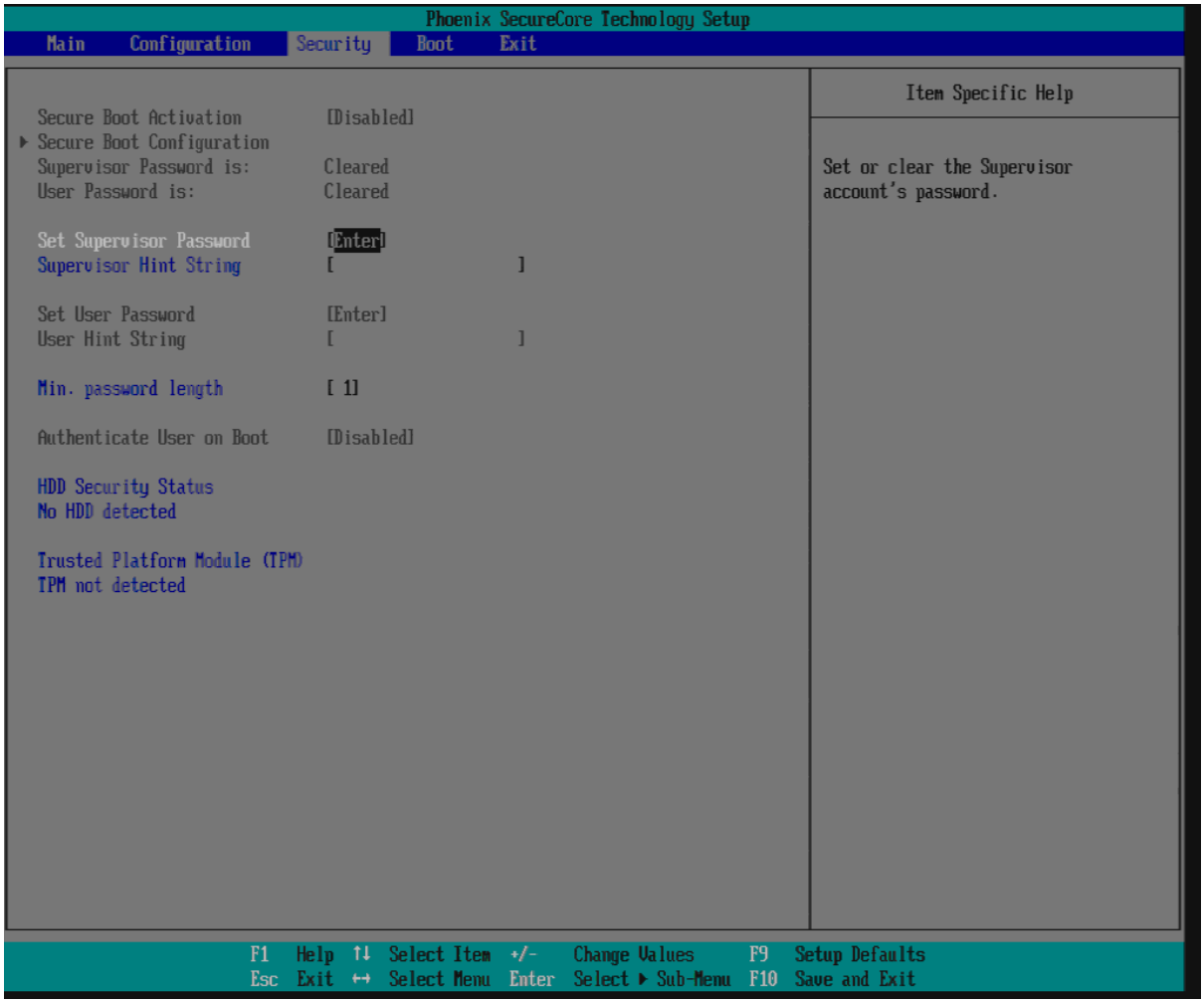
Clears SMBIOS events

View SMBIOS event log


Phoenix SecureCore Technology Setup
Configuration
View SMBIOS event log
Event Log is empty.
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▶ Sub-Menu F10 Save and Exit

4.4 Security

This section lets you set security passwords to control access to the system at boot time and/or when entering the BIOS setup program. Some systems have a single password, while many newer ones now have two: a supervisor and a user password.


Phoenix SecureCore Technology Setup
Main Configuration Security Boot Exit
Item Specific Help
Secure Boot Activation [Disabled]
Secure Boot Configuration
Supervisor Password is: Cleared
User Password is: Cleared
Set or clear the Supervisor account's password.
Set Supervisor Password [Enter]
Supervisor Hint String [ ]
Set User Password [Enter]
User Hint String [ ]
Min. password length [1]
Authenticate User on Boot [Disabled]
HDD Security Status
No HDD detected
Trusted Platform Module (TPM)
TPM not detected
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit

Set Supervisor Password

Set or clear Supervisor account's Password

Supervisor User Hint String

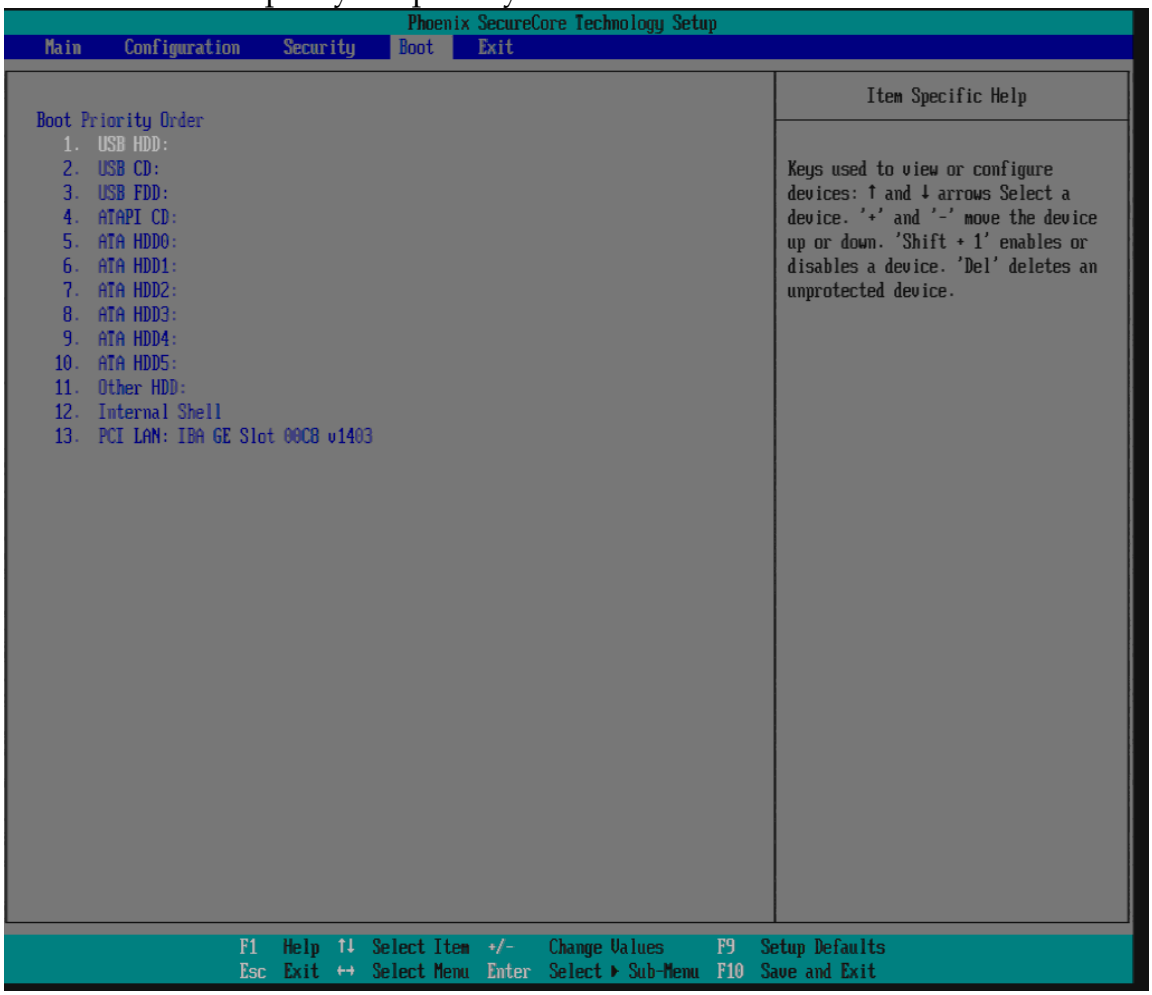
Press Enter to type Supervisor Hint String.

Min. password length

Set the minimum number of characters for password (1-20).

4.5 Boot

Use this menu to specify the priority of boot devices.


Phoenix SecureCore Technology Setup
Main
Configuration
Security
Boot
Exit
Boot Priority Order
1. USB HDD:
2. USB CD:
3. USB FDD:
4. ATAPI CD:
5. ATA HDD0:
6. ATA HDD1:
7. ATA HDD2:
8. ATA HDD3:
9. ATA HDD4:
10. ATA HDD5:
11. Other HDD:
12. Internal Shell
13. PCI LAN: IBA GE Slot 00C8 v1403
Item Specific Help
Keys used to view or configure devices: ↑ and ↓ arrows Select a device. '+' and '-' move the device up or down. 'Shift + 1' enables or disables a device. 'Del' deletes an unprotected device.
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit

4.6 Exit

This menu allows you to load the BIOS default values or factory default settings into the BIOS and exit the BIOS setup utility with or without changes.

Phoenix SecureCore Technology Setup
Main
Configuration
Security
Boot
Exit
Exit Saving Changes
Exit Discarding Changes
Load Setup Defaults
Discard Changes
Save Changes
Item Specific Help
Equal to F10, save all changes of all menus, then exit setup configure driver. Finally resets the system automatically.
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit

Exit Saving Changes

Equal to F10, save all changes of all menus, then exit system setup configure setup configure driver. Finally resets the system automatically.

Exit Discarding Changes

Equal to ESC, never save changes, then exit setup configure driver.

Load Setup Defaults

Equal to F9. Load standard default values.

Discard Changes

Load the original value of this boot time. Not the default Setup value.

Save Changes

Save all changes of all menus, but do not reset system.

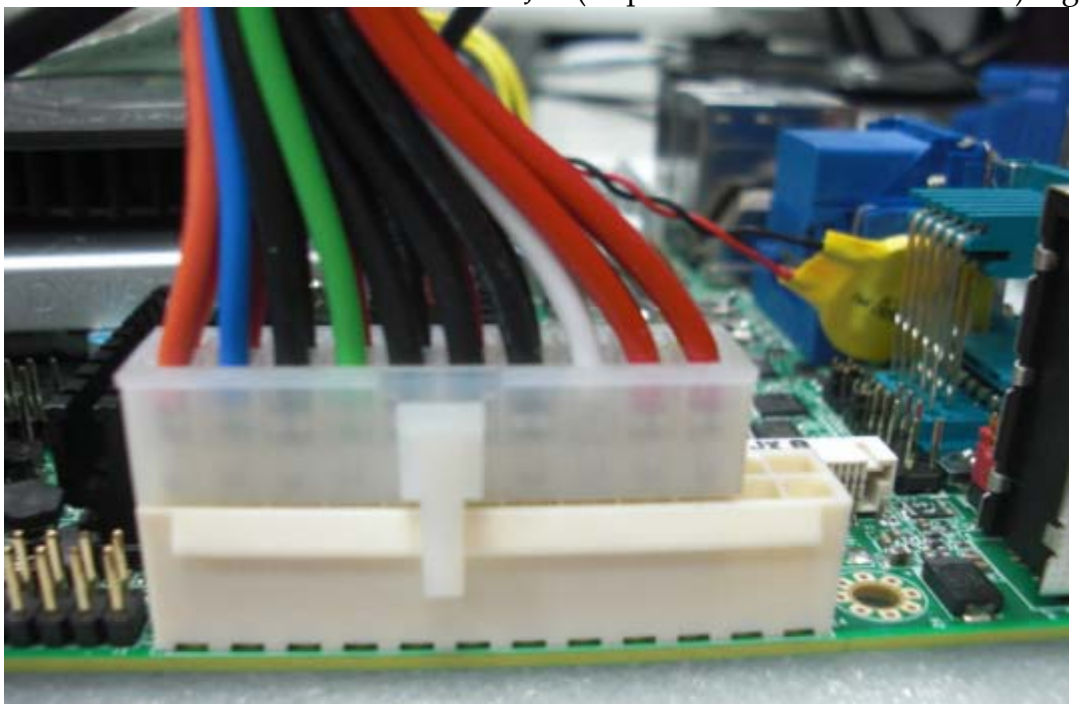
Chapter 5
Troubleshooting

This chapter provides a few useful tips to quickly get WADE-8015 running with success. As basic hardware installation has been addressed in Chapter 2, this chapter will primarily focus on system integration issues, in terms of BIOS setting, and OS diagnostics.

5.1 Hardware Quick Installation

ATX Power Setting

Unlike other Single board computer, WADE-8015 supports ATX only. Therefore, there is no other setting that really needs to be set up. However, there are only two connectors that must be connected—J18 (24 pins ATX Power Connector) Figure.



It is assumed that users have correctly adopted modules and connected all the devices cables required before turning on ATX power. CPU, CPU Fan, 204-pin DDR3 SDRAM, keyboard, mouse, SATA hard disk, VGA connector, device power cables, ATX accessories are good examples that deserve attention. With no assurance of properly and correctly accommodating these modules and devices, it is very possible to encounter system failures that result in malfunction of any device.

To make sure that you have a successful start with WADE-8015, it is recommended, when going with the boot-up sequence, to hit "DEL" key and enter the BIOS setup menu to tune up a stable BIOS configuration so that you can wake up your system far well.

Loading the default optimal setting

When prompted with the main setup menu, please scroll down to "**Load Setup Defaults"**, press "Enter" and "Y" to load in default optimal BIOS setup. This will force your BIOS setting back to the initial factory configuration. It is recommended to do this so you can be sure the system is running with the BIOS setting that Portwell has highly endorsed. As a matter of fact, users can load the default BIOS setting any time when system appears to be unstable in boot up sequence.

5.2 FAQ

Symptom: SBC keeps beeping, and no screen has shown.

Solution: In fact, each beep sound represents different definition of error message. Please refer to table as following:

Beep sounds	Meaning	Action
One long beep with one short beeps	DRAM error	Change DRAM or reinstall it
One long beep constantly	DRAM error	Change DRAM or reinstall it
One long beep with two short beeps	Monitor or Display Card error	Please check Monitor connector whether it inserts properly
Beep rapidly	Power error warning	Please check Power mode setting

Question: I forget my password of system BIOS, what am I supposed to do?

Answer: You can simply short 2-3 pins on JP4 to clean your password.

Note:
Please visit our technical web site at
http://www.portwell.com.tw
For additional technical information, which is not covered in this manual, you can mail to tsd@portwell.com.tw or you can also send mail to our sales, they wull be very delighted to forward them to us.

System Memory Address Map

Each On-board device in the system is assigned a set of memory addresses, which also can be identical of the device. The following table lists the system memory address used for your reference.

System Memory Address Map		
Memory Area	**Size**	**Description**
0000-003F	1 K	Interrupt Area
0040-004F	0.3 K	BIOS Data Area
0050-006F	0.5 K	System Data
0070-03DE	13 K	DOS
03DF-049A	2.9 K	Program Area
049B-9AFF	601 K	【Available】
9B00-9CFF	8 K	Unused
First Meg	**-- Conventional memory end at 639K --**	
9D00-9DFF	4 K	Extended BIOS Area
9E00-9FFF	8 K	Unused
A000-AFFF	64 K	VGA Graphics
B000-B7FF	32 K	Unused
B800-BFFF	32 K	VGA Text
C000-CE7F	58 K	Video ROM
CE80-EFFF	134 K	Unused
F000-FFFF	64 K	System ROM
HMA	64 K	First 64K Extended

Interrupt Request Lines (IRQ)

Peripheral devices can use interrupt request lines to notify CPU for the service required. The following table shows the IRQ used by the devices on board.

Interrupt Request Lines IRQ		
IRQ#	**Current Use**	**Default Use**
IRQ 0	Unused	System Timer
IRQ 1	System ROM	Keyboard Event
IRQ 2	【Unassigned】	Usable IRQ
IRQ 3	【Unassigned】	Usable IRQ
IRQ 4	【Unassigned】	Usable IRQ
IRQ 5	【Unassigned】	Usable IRQ
IRQ 6	System ROM	Diskette Event
IRQ 7	Unused	Usable IRQ
IRQ 8	System ROM	Real-Time Clock
IRQ 9	【Unassigned】	Usable IRQ
IRQ 10	【Unassigned】	Usable IRQ
IRQ 11	【Unassigned】	Usable IRQ
IRQ 12	System ROM	IBM Mouse Event
IRQ 13	System ROM	Coprocessor Error
IRQ 14	System ROM	Hard Disk Event
IRQ 15	【Unassigned】	Usable IRQ